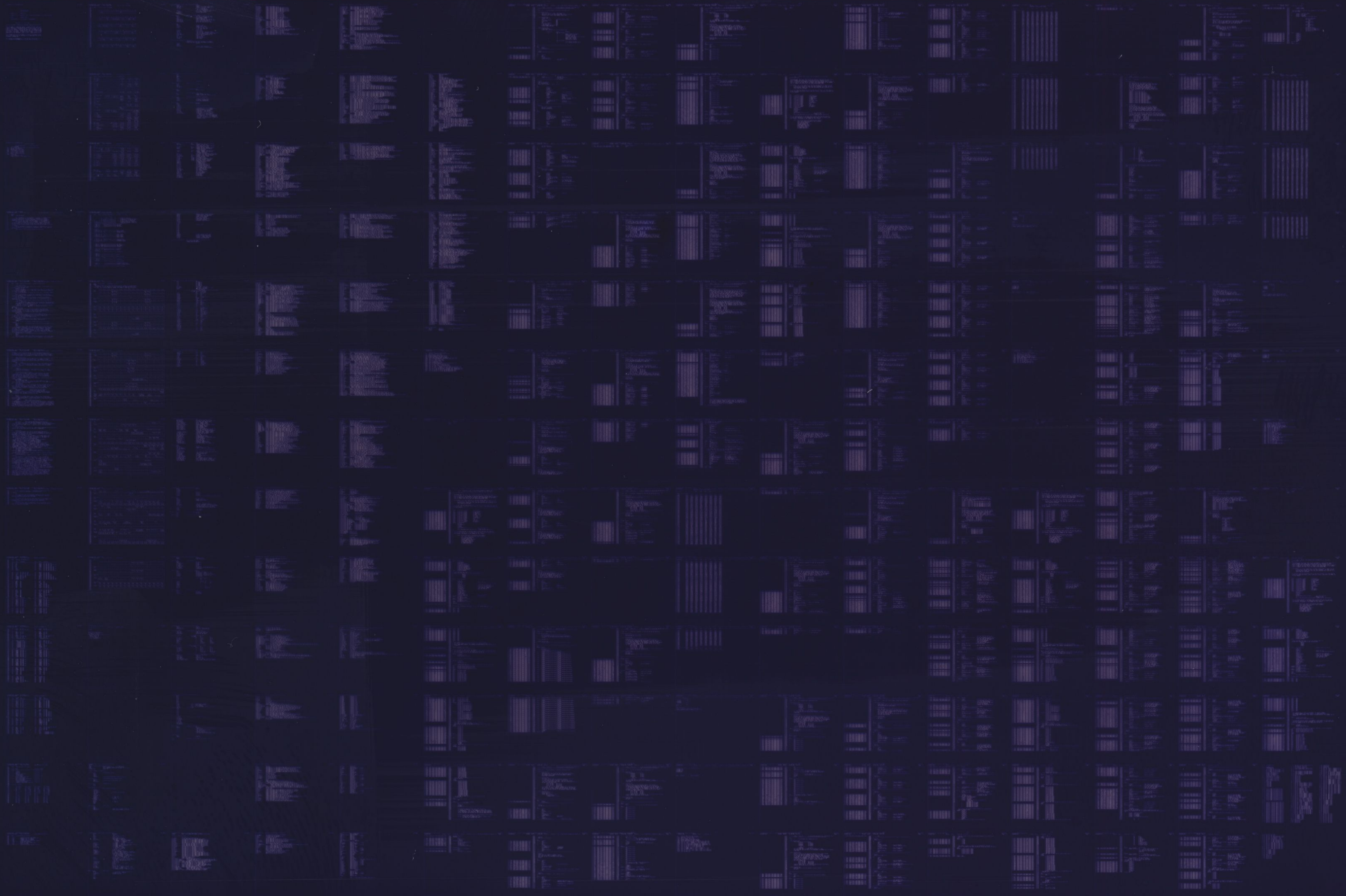
ESKAH-13.2

VAX 11/780 (KA780)
MICRODIAG VOL #1

EP-ESKAH-DL-13.2
FICHE 1 OF 7

APR 1983
COPYRIGHT© 77-83
MADE IN USA



ESKAH-13.2
VAX 11/780 (KA780)
MICRODIAG VOL #1
EP-ESKAH-DL-13.2
FICHE 2 OF 7

APR 1983
COPYRIGHT© 77-83
MADE IN USA

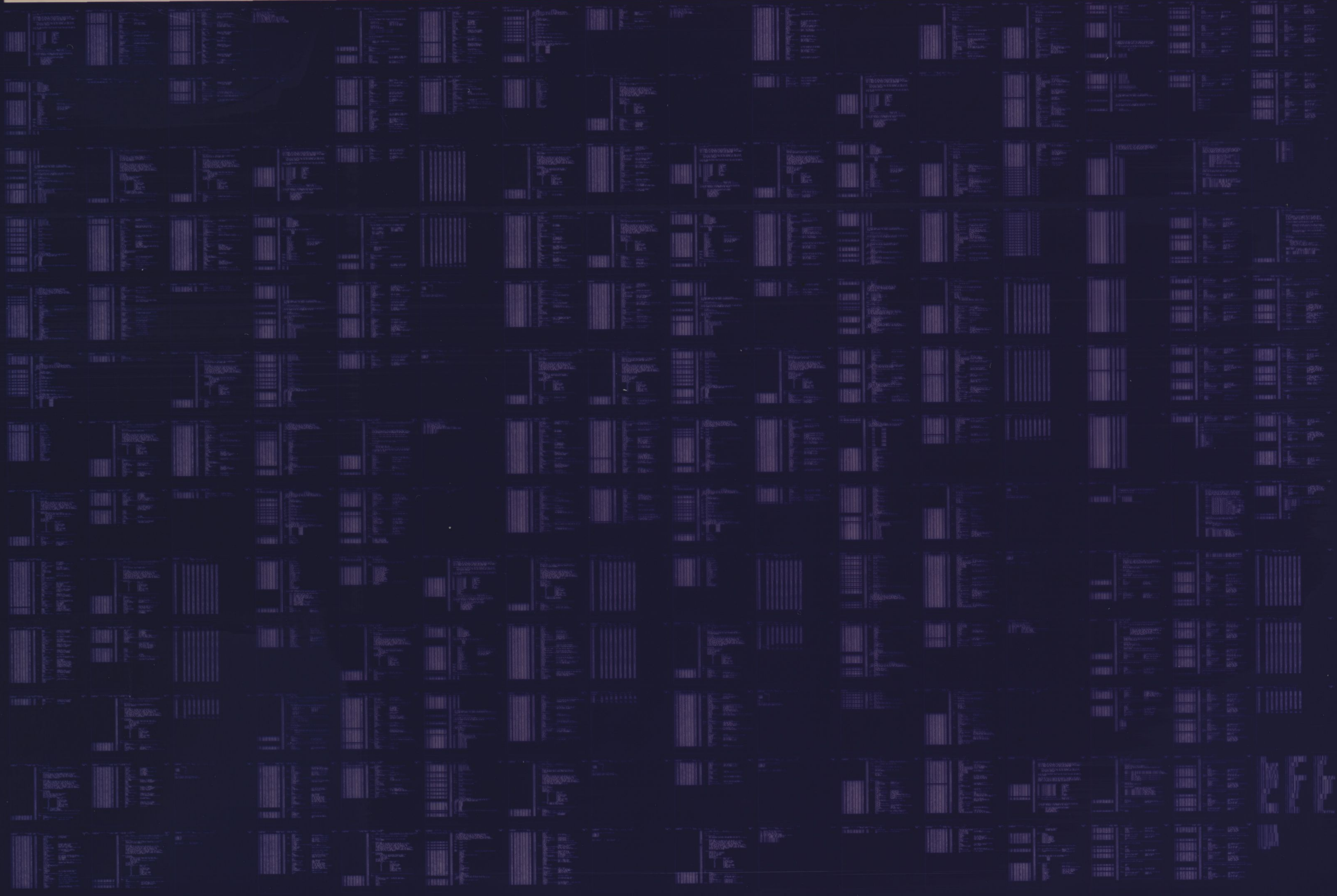
ESKAH-13.2 VAX 11/780 (KA780)
MICRODIAG VOL #1
EP-ESKAH-DL-13.2
FICHE 3 OF 7

APR 1983
COPYRIGHT© 77-83
MADE IN USA

ESKAH-13.2 VAX 11/780 (KA780)
MICRODIAG VOL #1

EP-ESKAH-DL-13.2
FICHE 4 OF 7

APR 1983
COPYRIGHT© 77-83
MADE IN USA



ESKAH-13.2

VAX 11/780 (KA780)
MICRODIAG VOL #1

EP-ESKAH-DL-13.2
FICHE 5 OF 7

APR 1983
COPYRIGHT© 77-83
MADE IN USA

ESKAH-13.2 VAX 11/780 (KA780) MICRODIAG VOL #1

EP-ESKAH-DL-13.2 FICHE 6 OF 7

APR 1983
COPYRIGHT© 77-83
MADE IN USA

digital

ESKAH-13.2 VAX 11/780 (KA780) EP-ESKAH-DL-13.2 APR 1983
MICRODIAG VOL #1 FICHE 7 OF 7

COPYRIGHT© 77-83
MADE IN USA

digital

IDENTIFICATION

PRODUCT ID: ESKAH-V13.2

PRODUCT TITLE: ESKAH132 VAX 11/780 MICRO DIAGNOSTIC GO CHAIN (VOLUME 1)

DATE: JANUARY 1983

MAINTAINED BY: VAX DIAGNOSTIC ENGINEERING

COPYRIGHT (C) 1977, 1983
DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS 01754

THIS SOFTWARE IS FURNISHED UNDER A LICENSE FOR USE ONLY ON A SINGLE COMPUTER SYSTEM AND MAY BE COPIED ONLY WITH THE INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR ANY OTHER COPIES THEREOF, MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY OTHER PERSON EXCEPT FOR USE ON SUCH SYSTEM AND TO ONE WHO AGREES TO THESE LICENSE TERMS. TITLE TO AND OWNERSHIP OF THE SOFTWARE SHALL AT ALL TIMES REMAIN IN DEC.

THE INFORMATION IN THIS DOCUMENT IS SUBJECT TO CHANGE WITHOUT NOTICE AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT CORPORATION.

DEC ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF ITS SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DEC.

```
;                                Table of Contents
;
; 1             DOC.MIC[400,4005]       13:21 7-OCT-1977
; 2     STAR MICROCODE
; 18    How to Read the Microcode -- Formats & Constructs
; 201   Opcodes and Mnemonics
; 351   Operand Specifier Codes
; 389   Fixed Address Allocation
; 399   Control Store Field Map
; 441   Branch Enable Functions
; 534   Memory Control Functions
; 588   ID Bus Map
;       Cross Reference Index
;       UCODE Location / Line Number Index
```

```
.NOBIN
.TOC    "STAR MICROCODE"

;       The information in this document is subject to change without
; notice and should not be construed as a commitment by Digital
; Equipment Corporation.  Digital Equipment Corporation assumes no
; responsibility for any errors that may appear in this document.
;       The software described in this document is furnished to the
; purchaser under a license for use on a single computer system and
; can be copied (with inclusion of Digital's copyright notice) only
; for use in such system, except as may otherwise be provided in writing
; by Digital.
;       Digital Equipment Corporation assumes no responsibility for the
; use or reliability of its software on equipment that is not supplied
; by Digital.
;       Copyright (C) 1977, Digital Equipment Corporation

```

```
.PAGE   "How to Read the Microcode -- Formats & Constructs"

;(1)    Field Definitions
;       These occur at the beginning of the listing, in the source file
; DEF.MIC.  They have the form:
;       SYMBOL/=J,K,L,M
;       The first parameter (J) is meaningful only when "D" is specified
; as the default mechanism, and in that case, gives the default value of
; the field in hexadecimal.
;       The second parameter (K) gives the field size in (decimal) number
; of bits.
;       The third parameter (L) gives the field position in decimal
; as the bit number of the rightmost bit of the field.  Bits are numbered
; from 0 on the right.
;       The fourth parameter (M) is optional, and selects a default
; mechanism for the field.  The legal values of this parameter are the
; characters "D", or "+".
;         "D" means J is the default value of the field if no explicit
;       value is specified.
;         "+" is used on the jump address field to specify that the default
;       jump address is the address of the next instruction assembled (not,
;       in general, the current location +1).
;       In general, a field corresponds to the set of bits which provide
; select inputs for mixers or decoders, or controls for ALU's.
; Examples:
;       AMX/=0,2,20,D
;       The microcode field which controls AMX is two bits wide
; and the rightmost bit is shown in the listing as bit 20 of the
; microinstruction.  If no value is specifically requested for the field,
; the microassembler will ensure that the field is 0.
;       ALU/=0,4,25
;       The field which controls alu is 4 bits wide, ending on
; bit 25.  The fourth parameter of the field is omitted, so the field
; is avai able to the microassembler (if no value is explicitly
; called out for the field) for modification.
;(2)    Value Definitions
;       Following a field definition, symbols may be created in that
; field to correspond to values of the field.  the form is:
;       SYMBOL=N
;       "N" is, in hex, the value of symbol when used in the field.
; examples:
;       ALU/=0,4,25     ;Field definition in which following symbols exist
;       XOR=7
;       A+B=8
;       Here the symbols "XOR" and "A+B" are defined for the "ALU" field.
; To the assembler, therefore, writing "ALU/XOR" means put the value 7
; into the 4-bit field ending on bit 25 of the microword.  The symbols
; are chosen for mnemonic significance, of course, so one reading
; the microcode would interpret "ALU/XOR" as "the output of ALU shall be the
; exclusive or of its A and B inputs".  Similiarly, "ALU/A+B" is read as
; "ALU produces the sum of A and B".
;       SCK/=0,1,23,D   ;field definition for following symbols
;       NOP=0
;       LOAD=1
;       Here the symbols "NOP" and "LOAD" are defined for the field named
; "SCK", which controls the clocking of the SC register.  We could write
; SCK/NOP in every microinstruction in which we did not want the SC
; to change, but to simplify things, we use the default mechanism, which
; ensures that unless a microinstruction explicitly specifies a change
; to SC (by SCK/LOAD), the assembler will make the value of this field 0.
;
;(3)    Label Definitions
;       A micro instruction may be labelled by a symbol followed by colon
; preceding the microinstruction definition.  The address of the
; microinstruction becomes the value of the symbol in the field named "J".
; example:
;       FOO:    J/FOO
;       This is a microinstruction whose "J" field (jump address) contains
; the value "FOO".  It also defines the symbol "FOO" to be the address
; of itself.  Therefore, if executed by the microprocessor, it would
; loop on itself.
;
;(4)    Comments
;       A semicolon anywhere on a line causes the rest of the line
; to be ignored by the assembler.  This text is an example of comments.
;
;(5)    Microinstruction Definition
;       A word of microcode is defined by specifying a field name,
; followed by slash (/), followed by a value.  The value may be a
; symbol defined for that field, a hex digit string, or a decimal
; digit string (distinguished by the fact that it is terminated by
; a period). Several fields may be specified
; in one microinstruction by separating field/value specifications with
; commas.  example:
;       AMX/LA,BMX/D,ALU/A-B
;       The field named "AMX" is given the value named "LA" (to
; cause the mixer on the A side of ALU to select LA), field "BMX" has value
; "D", field "ALU" has value "A-B".
;(6)    Continuation
;       The definition of a microinstruction may be continued onto two or
; more lines by breaking it after any comma.  In other words, if the
; last non-blank, non-comment character on a line is a comma, the
; instruction specification is continued on the following line.
; example:
;       AMX/LA,BMX/D,           ;Select LA & D as ALU inputs
;       ALU/A-B                 ;Select ALU to perform A-B
; By convention, a blank line and a line of hyphens appears between
; microinstructions, to make it easier for the reader to distinguish
; continuation from separate microinstructions.
;
;(7)    Macros
;       A macro is a symbol whose value is one or more field/value
; specifications and/or macros.  A macro definition is a line containing
; the macro name followed by a quoted string which is the value of the
; macro.  example:
;       D_LA-D          "AMX/LA,BMX/D,ALU/A-B,D_ALU"
; The appearance of a macro in a microinstruction definition is equivalent
; to the appearance of its value.  Macros may have parameters, enclosed in
; square brackets ("[" and "]").  The definition of a macro with parameters
; includes paired brackets to indicate where the parameters should go, and
; uses "@" followed by a decimal digit string to indicate which symbols in
; the macro body should be replaced by the parameters:
```

```
;       RC[]_D+K[]      "AMX/D,KMX/@2,BMX/KMX,ALU/A+B,SPO.RC/@1"
;       This macro indicates that the first parameter (selected by @1)
; should be used as the value in the "SPO.RC" field, and the second parameter
; as the value of the "KMX" field.  A typical use of this macro might
; look like:
;       RC[T1]_D+K[34]
; In this case, the expansion would be  "AMX/D,KMX/34,BMX/KMX,ALU/A+B,SPO.RC/T1"
;  Macros for various functions are defined in "MACRO.MIC".
;
;(8)    Pseudo Ops
;       The micro assembler has the following pseudo-operators:
; .UCODE and .DCODE select the ram into which subsequent microcode will
; be loaded, and therefore the field definitions and macros which are
; meaningful in subsequent microcode.
; .TITLE defines a string of text to appear in the page header, and
; .TOC defines an entry for the table of contents at the beginning.
; .PAGE starts a new page of listing, and creates a .TOC entry if
;       a quoted string follows the pseudo-op.
; .SET defines the value of a conditional assembly parameter,
; .CHANGE redefines a conditional assembly parameter,
; .DEFAULT assigns a value to an undefined parameter.
; .IF enables assembly if the value of the parameter is not zero,
; .IFNOT enables assembly if the parameter value is zero, and
; .ENDIF re-enables assembly if suppressed by the parameter named.
; .RTOL enables bits numbered from 0 on the right of the microinstruction.
; .HEXADECIMAL enables radix to be 16 instead of default radix 8.
; .REGION defines prefered parts of the .UCODE space.
; .CREF and .NOCREF enable and disable the collection of cross-reference
;       information on symbol usage.
; .LIST and .NOLIST enable and disable output listing.
; .BIN and .NOBIN enable and disable leaving room at the left margin
;       for binary output.
; .MACHINE selects microassembler features needed for special microproccessors.
;(9)    Location Control
;       A microinstruction "labelled" with a number is assigned to that
; address.
;       The character "=" at the beginning of a line, followed by
; a string of 0's, 1's, and/or *'s, specifies a constraint on the
; address of following microinstructions.  The number of characters
; in the constraint string (excluding the "=") is the number of low-order
; bits constrained in the address.  The microassembler attempts to find
; an unused location whose address has 0 bits in the positions
; corresponding to 0's in the constraint string and 1 bits where the
; constraint has 1's.  Asterisks denote "don't care" bit positions.
;       If there are any 0's in the constraint string, the constraint
; implies a block of <2**N> microwords, where N is the number of 0's
; in the string.  All locations in the block will have 1's in the address
; bits corresponding to 1's in the string, and bit positions denoted by *'s
; will be the same in all locations of the block.
;       In such a constraint block, the default address progression is
; counting in the "0" positions of the constraint string, but a new
; constraint string occuring within a block may force skipping over
; some locations of the block.  Within a block, a new constraint
; string does not change the pattern of default address progression, it
; merely advances the location counter over those locations.  The
; microassembler will later fill them in.
; 186   ;       A null constraint string ("=" followed by anything but "0",
; 187   ; "1", or "*") serves to terminate a constraint block.
; 188   ; examples:
; 189   ;       =0
; 190   ;       This specifies that the low-order address bit must be zero--
; 191   ; The microassembler finds an even-odd pair of locations, and puts
; 192   ; the next two microinstructions into them.
; 193   ;       =11
; 194   ;       This specifies that the two low-order bits of the address must
; 195   ; both be ones.  Since there are no 0's in this constraint, the
; 196   ; assembler finds only one location meeting the constraint.
; 197   ;       =0*****
; 198   ;       This specifies a pair of addresses, the first having a zero in
; 199   ; the "20" bit, and the second having a one in that position, but all
; 200   ; other bit positions the same.
```

```
        .PAGE   "Opcodes and Mnemonics"

        ; hex   name    operands                        hex     name    operands
        ;----+-------+------------------------------+-----+-------+-------------------------
        ; 00    HALT                                    20      ADDP4   RW, AB, RW, AB
        ; 01    NOP                                     21      ADDP6   RW, AB, RW, AB, RW, AB
        ; 02    REI                                     22      SUBP4   RW, AB, RW, AB
        ; 03    BPT                                     23      SUBP6   RW, AB, RW, AB, RW, AB
        ; 04    RET                                     24      CVTPT   RW, AB, AB, RW, AB
        ; 05    RSB                                     25      MULP    RW, AB, RW, AB, RW, AB
        ; 06    LDPCTX                                  26      CVTTP   RW, AB, AB, RW, AB
        ; 07    SVPCTX                                  27      DIVP    RW, AB, RW, AB, RW, AB

        ; 08    CVTPS   RW, AB, RW, AB                  28      MOVC3   RW, AB, AB
        ; 09    CVTSP   RW, AB, RW, AB                  29      CMPC3   RW, AB, AB
        ; 0A    INDEX   RL, RL, RL, RL, RL, WL          2A      SCANC   RW, AB, AB, RB
        ; 0B    CRC     AB, RL, RW, AB, WL              2B      SPANC   RW, AB, AB, RB
        ; 0C    PROBER  RB, RW, AB                      2C      MOVC5   RW, AB, RB, RW, AB
        ; 0D    PROBEW  RB, RW, AB                      2D      CMPC5   RW, AB, RB, RW, AB
        ; 0E    INSQUE  AB, AB                          2E      MOVTC   RW, AB, RB, AB, RW, AB
        ; 0F    REMQUE  AB, WL                          2F      MOVTUC  RW, AB, RB, AB, RW, AB

        ; 10    BSBB    BB                              30      BSBW    BW
        ; 11    BRB     BB                              31      BRW     BW
        ; 12    BNEQ    BB                              32      CVTWL   RW, WL
        ; 13    BEQL    BB                              33      CVTWB   RW, WB
        ; 14    BGTR    BB                              34      MOVP    RW, AB, AB
        ; 15    BLEQ    BB                              35      CMPP3   RW, AB, AB
        ; 16    JSB     AB                              36      CVTPL   RW, AB, WL
        ; 17    JMP     AB                              37      CMPP4   RW, AB, RW, AB

        ; 18    BGEQ    BB                              38      EDITPC  RW, AB, AB, AB
        ; 19    BLSS    BB                              39      MATCHC  RW, AB, RW, AB
        ; 1A    BGTRU   BB                              3A      LOCC    RB, RW, AB
        ; 1B    BLEQU   BB                              3B      SKPC    RB, RW, AB
        ; 1C    BVC     BB                              3C      MOVZWL  RW, WL
        ; 1D    BVS     BB                              3D      ACBW    RW, RW, MW, BW
        ; 1E    BGEQU   BB                              3E      MOVAW   AW, WL
        ; 1F    BLSSU   BB                              3F      PUSHAW  AW
        ; hex   name    operands                        hex     name    operands
        ;----+-------+------------------------------+-----+-------+-------------------------
        ; 40    ADDF2   RF, MF                          60      ADDD2   RD, MD
        ; 41    ADDF3   RF, RF, WF                      61      ADDD3   RD, RD, WD
        ; 42    SUBF2   RF, MF                          62      SUBD2   RD, MD
        ; 43    SUBF3   RF, RF, WF                      63      SUBD3   RD, RD, WD
        ; 44    MULF2   RF, MF                          64      MULD2   RD, MD
        ; 45    MULF3   RF, RF, WF                      65      MULD3   RD, RD, WD
        ; 46    DIVF2   RF, MF                          66      DIVD2   RD, MD
        ; 47    DIVF3   RF, RF, WF                      67      DIVD3   RD, RD, WD

        ; 48    CVTFB   RF, WB                          68      CVTDB   RD, WB
        ; 49    CVTFW   RF, WW                          69      CVTDW   RD, WW
        ; 4A    CVTFL   RF, WL                          6A      CVTDL   RD, WL
        ; 4B    CVTRFL  RF, WL                          6B      CVTRDL  RD, WL
        ; 4C    CVTBF   RB, WF                          6C      CVTBD   RB, WD
        ; 4D    CVTWF   RW, WF                          6D      CVTWD   RW, WD
```

```
; 4E    CVTLF    RL, WF                    6E    CVTLD    RL, WD
; 4F    ACBF     RF, RF, MF, BW            6F    ACBD     RD, RD, MD, BW

; 50    MOVF     RF, WF                    70    MOVD     RD, WD
; 51    CMPF     RF, RF                    71    CMPD     RD, RD
; 52    MNEGF    RF, WF                    72    MNEGD    RD, WD
; 53    TSTF     RF                        73    TSTD     RD
; 54    EMODF    RF, RB, RF, WL, WF        74    EMODD    RD, RB, RD, WL, WD
; 55    POLYF    RF, RW, AB                75    POLYD    RD, RW, AB
; 56    CVTFD    RF, WD                    76    CVTDF    RD, WF
; 57    * RESERVED TO DEC *                77    * RESERVED TO DEC *

; 58    ADAWI    RW, MW                    78    ASHL     RB, RL, WL
; 59    * RESERVED TO DEC *                79    ASHQ     RB, RQ, WQ
; 5A    * RESERVED TO DEC *                7A    EMUL     RL, RL, RL, WQ
; 5B    * RESERVED TO DEC *                7B    EDIV     RL, RQ, WL, WL
; 5C    * RESERVED TO DEC *                7C    CLRQ     WQ
; 5D    * RESERVED TO DEC *                7D    MOVQ     RQ, WQ
; 5E    * RESERVED TO DEC *                7E    MOVAQ    AQ, WL
; 5F    * RESERVED TO DEC *                7F    PUSHAQ   AQ
; hex   name     operands                  hex   name     operands
;-----+-------+--------------------------+-----+-------+--------------------------
; 80    ADDB2    RB, MB                    A0    ADDW2    RW, MW
; 81    ADDB3    RB, RB, WB                A1    ADDW3    RW, RW, WW
; 82    SUBB2    RB, MB                    A2    SUBW2    RW, MW
; 83    SUBB3    RB, RB, WB                A3    SUBW3    RW, RW, WW
; 84    MULB2    RB, MB                    A4    MULW2    RW, MW
; 85    MULB3    RB, RB, WB                A5    MULW3    RW, RW, WW
; 86    DIVB2    RB, MB                    A6    DIVW2    RW, MW
; 87    DIVB3    RB, RB, WB                A7    DIVW3    RW, RW, WW

; 88    BISB2    RB, MB                    A8    BISW2    RW, MW
; 89    BISB3    RB, RB, WB                A9    BISW3    RW, RW, WW
; 8A    BICB2    RB, MB                    AA    BICW2    RW, MW
; 8B    BICB3    RB, RB, WB                AB    BICW3    RW, RW, WW
; 8C    XORB2    RB, MB                    AC    XORW2    RW, MW
; 8D    XORB3    RB, RB, WB                AD    XORW3    RW, RW, WW
; 8E    MNEGB    RB, WB                    AE    MNEGW    RW, WW
; 8F    CASEB    RB, RB, RB                AF    CASEW    RW, RW, RW

; 90    MOVB     RB, WB                    B0    MOVW     RW, WW
; 91    CMPB     RB, RB                    B1    CMPW     RW, RW
; 92    MCOMB    RB, WB                    B2    MCOMW    RW, WW
; 93    BITB     RB, RB                    B3    BITW     RW, RW
; 94    CLRB     WB                        B4    CLRW     WW
; 95    TSTB     RB                        B5    TSTW     RW
; 96    INCB     MB                        B6    INCW     MW
; 97    DECB     MB                        B7    DECW     MW

; 98    CVTBL    RB, WL                    B8    BISPSW   RW
; 99    CVTBW    RB, WW                    B9    BICPSW   RW
; 9A    MOVZBL   RB, WL                    BA    POPR     RW
; 9B    MOVZBW   RB, WW                    BB    PUSHR    RW
; 9C    ROTL     RB, RL, WL                BC    CHMK     RW
; 9D    ACBB     RB, RB, MB, BW            BD    CHME     RW
; 9E    MOVAB    AB, WL                    BE    CHMS     RW
; 9F    PUSHAB  AB                                BF    CHMU    RW
; hex   name    operands                          hex   name    operands
;----+-------+-------------------------------+-----+-------+-------------------------
; C0    ADDL2   RL, ML                            E0    BBS     RL, VB, BB
; C1    ADDL3   RL, RL, WL                        E1    BBC     RL, VB, BB
; C2    SUBL2   RL, ML                            E2    BBSS    RL, VB, BB
; C3    SUBL3   RL, RL, WL                        E3    BBCS    RL, VB, BB
; C4    MULL2   RL, ML                            E4    BBSC    RL, VB, BB
; C5    MULL3   RL, RL, WL                        E5    BBCC    RL, VB, BB
; C6    DIVL2   RL, ML                            E6    BBSSI   RL, VB, BB
; C7    DIVL3   RL, RL, WL                        E7    BBCCI   RL, VB, BB

; C8    BISL2   RL, ML                            E8    BLBS    RL, BB
; C9    BISL3   RL, RL, WL                        E9    BLBC    RL, BB
; CA    BICL2   RL, ML                            EA    FFS     RL, RB, VB, WL
; CB    BICL3   RL, RL, WL                        EB    FFC     RL, RB, VB, WL
; CC    XORL2   RL, ML                            EC    CMPV    RL, RB, VB, RL
; CD    XORL3   RL, RL, WL                        ED    CMPZV   RL, RB, VB, RL
; CE    MNEGL   RL, WL                            EE    EXTV    RL, RB, VB, WL
; CF    CASEL   RL, RL, RL                        EF    EXTZV   RL, RB, VB, WL

; D0    MOVL    RL, WL                            F0    INSV    RL, RL, RB, VB
; D1    CMPL    RL, RL                            F1    ACBL    RL, RL, ML, BW
; D2    MCOML   RL, WL                            F2    AOBLSS  RL, ML, BB
; D3    BITL    RL, RL                            F3    AOBLEQ  RL, ML, BB
; D4    CLRL    WL                                F4    SOBGEQ  ML, BB
; D5    TSTL    RL                                F5    SOBGTR  ML, BB
; D6    INCL    ML                                F6    CVTLB   RL, WB
; D7    DECL    ML                                F7    CVTLW   RL, WW

; D8    ADWC    RL, ML                            F8    ASHP    RB, RW, AB, RB, RW, AB
; D9    SBWC    RL, ML                            F9    CVTLP   RL, RW, AB
; DA    MTPR    RL, RL                            FA    CALLG   AB, AB
; DB    MFPR    RL, WL                            FB    CALLS   RL, AB
; DC    MOVPSL  WL                                FC    XFC
; DD    PUSHL   RL                                FD    ESCD    * RESERVED TO DEC *
; DE    MOVAL   AL, WL                            FE    ESCE    * RESERVED TO DEC *
; DF    PUSHAL  AL                                FF    ESCF    * RESERVED TO DEC *
```

```
        .PAGE   "Operand Specifier Codes"

        ; Hex   Name                            R M W A V Index
        ;-----------------------------------------------------
        ; 0-3   Literal                         y f f f f   f
        ;  4    Indexed                         y y y y y   f
        ;  5    Register                        y y y f y   f
        ;  6    Register deferred               y y y y y   y
        ;  7    Autodecrement                   y y y y y   ux
        ;  8    Autoincrement                   y y y y y   ux
        ;  9    Autoincrement deferred          y y y y y   ux
        ;  A    Byte Displacement               y y y y y   y
        ;  B    Byte Displacement deferred      y y y y y   y
        ;  C    Word Displacement               y y y y y   y
        ;  D    Word Displacement deferred      y y y y y   y
        ;  E    Longword Displacement           y y y y y   y
        ;  F    Longword Displacement deferred  y y y y y   y

        ;Floating Literals

        ;       Hex  Value      Hex  Value      Hex  Value      Hex  Value
        ;       ----------      ----------      ----------      ----------
        ;       00 - 1/2        01 - 9/16       02 - 5/8        03 - 11/16
        ;       04 - 3/4        05 - 13/16      06 - 7/8        07 - 15/16
        ;       08 - 1          09 - 1 1/8      0A - 1 1/4      0B - 1 3/8
        ;       0C - 1 1/2      0D - 1 5/8      0E - 1 3/4      0F - 1 7/8
        ;       10 - 2          11 - 2 1/4      12 - 2 1/2      13 - 2 3/4
        ;       14 - 3          15 - 3 1/4      16 - 3 1/2      17 - 3 3/4
        ;       18 - 4          19 - 4 1/2      1A - 5          1B - 5 1/2
        ;       1C - 6          1D - 6 1/2      1E - 7          1F - 7 1/2
        ;       20 - 8          21 - 9          22 - 10         23 - 11
        ;       24 - 12         25 - 13         26 - 14         27 - 15
        ;       28 - 16         29 - 18         2A - 20         2B - 22
        ;       2C - 24         2D - 26         2E - 28         2F - 30
        ;       30 - 32         31 - 36         32 - 40         33 - 44
        ;       34 - 48         35 - 52         36 - 56         37 - 60
        ;       38 - 64         39 - 72         3A - 80         3B - 88
        ;       3C - 96         3D - 104        3E - 112        3F - 120
```

```
; 389   .PAGE   "Fixed Address Allocation"
; 390
; 391   ; 1000          UNEXPECTED MICRO TRAP ERROR CALL
; 392   ; 104E          "ERROR1" CALL TO CONSOLE
; 393   ; 105A          "ERROR2" CALL TO CONSOLE
; 394   ; 105E          INSTRUCTION THAT CALLS THE CONSOLE
; 395   ; 1100   110F   MICRO TRAP ENTRIES
; 396   ; 1155          MICRO ECO TAGET (FROM 12AA)
; 397   ; 12AA          ECO'D LOCATION
; 398   ; 13F0   13FF   SCRATCH LOCATIONS USED BY THE LSI-11
```

```
        .PAGE   "Control Store Field Map"

        ;       *               *               *               *               *
        ;         15  14  13  12! 11  10  09  08! 07  06  05  04! 03  02  01  00!
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*
        ;       !    EALU   !                       JMP                         !
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*


        ;       *               *               *               *               *
        ;         31  30  29  28! 27  26  25  24! 23  22  21  20! 19  18  17  16!
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*
        ;          IEK  !     MSC       !VAK!FEK!SCK!   CCK     ! EBMX  ! SMX   !
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*


        ;       *               *               *               *               *
        ;         47  46  45  44! 43  42  41  40! 39  38  37  36! 35  34  33  32!
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*
        ;       !ADS    MCT/CID     ! FS!           SPO             !   PCK     !
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*


        ;       *               *               *               *               *
        ;       ! 63  62  61  60! 59  58  57  56! 55  54  53  52! 51  50  49  48!
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*
        ;       !         KMX           !   SI/ACM  !      QK       !   SGN     !
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*


        ;       *               *               *               *               *
        ;         79  78  77  76! 75  74  73  72! 71  70  69  68! 67  66  65  64!
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*
        ;       !   DT  RMX         BEN         ! ACF   !     ALU       ! SUB   !
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*


        ;       *               *               *               *               *
        ;       ! 95  94  93  92! 91  90  89  88! 87  86  85  84! 83  82  81  80!
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*
        ;       !      IBC      !      DK       !   SHF     !   BMX     ! AMX   !
        ;       *---+---+---+---*---+---+---+---*---+---+---+---*---+---+---+---*
```

```
.PAGE   'Branch Enable Functions'       31-January-77

;BEN: Name                                :  UPC<02>  :  UPC<01>  :  UPC<00>  :
;---+--------------------------------------+-----------+-----------+-----------+
; 0 : NOP                                  :     0     :     0     :     0     :
;---+--------------------------------------+-----------+-----------+-----------+
; 1 : Z                                    :     0     :     0     :   ALU Z   :
;---+--------------------------------------+-----------+-----------+-----------+
; 2 : ROR                                  :  LA<01>   :   PSL<C>  :   LA<00>  :
;---+--------------------------------------+-----------+-----------+-----------+
; 3 : C31                                  :     0     :  ALU C31  :     0     :
;---+--------------------------------------+-----------+-----------+-----------+
; 4                                        :           :           :           :
;---+--------------------------------------+-----------+-----------+-----------+
; 5                                        :           :           :           :
;---+--------------------------------------+-----------+-----------+-----------+
; 6 : ACCelerator                          :  ACC UB2  :  ACC UB1  :  ACC UB0  :
;---+--------------------------------------+-----------+-----------+-----------+
; 7 :                                      :           :           :           :
;---+--------------------------------------+-----------+-----------+-----------+
; 8 : DATA TYPE     0= Normal  2= Field Src:  Read +   :  ASRC +   :  ASRC +   :
;VAX               1= Q + D   3= Addr Src :  Modify   :   VSRC    :   Q + D   :
;---+--------------------------------------+-----------+-----------+-----------+
; 8 : END DP1                              :  Read +   :  0 Class  : J Class + :
;-11:                                      :  Modify   :           :   DM27    :
;---+--------------------------------------+-----------+-----------+-----------+
; 9   IR2-1                                :     0     :   IR<2>   :   IR<1>   :
;VAX:                                      :           :           :           :
;---+--------------------------------------+-----------+-----------+-----------+
; 9 : PC Modes                             :     0     : SM or DM  :   Dst R   :
;-11:                                      :           :  47 + 57  :  .eq. PC  :
;---+--------------------------------------+-----------+-----------+-----------+
; A : REI                                  : Mode .lt. :           :           :
;   :                                      :  ASTLVL   :           :           :
;---+--------------------------------------+-----------+-----------+-----------+
; B : IB TEST       0= TB Miss 2= Stall    :     0     :IB running : IB ERROR +:
;   :               1= Error   3= Data OK  :           :           :DATA VALID :
;---+--------------------------------------+-----------+-----------+-----------+
; C : MUL                                  :  SC.ne.0  :   D<01>   :   D<00>   :
;---+--------------------------------------+-----------+-----------+-----------+
; D : SIGNS                                :   Q<31>   :  D.ne.0   :   D<31>   :
;---+--------------------------------------+-----------+-----------+-----------+
; E : INTERRUPT                            :  AC Low   : Internal  : Interrupt :
;   :                                      :           : Interrupt :  Request  :
;---+--------------------------------------+-----------+-----------+-----------+
; F : Decimal                              :     0     : D<7:0>    :  D<3:0>=  :
;   :                                      :           :   30-39   :  0B + 0D  :
;---+--------------------------------------+-----------+-----------+-----------+
;BEN: Name                     :  UPC<03>  :  UPC<02>  :  UPC<01>  :  UPC<00>  :
;---+--------------------------+-----------+-----------+-----------+-----------+
;10 : uTrap Vector             : uVECT<3>  : uVECT<2>  : uVECT<1>  : uVECT<0>  :
;---+--------------------------+-----------+-----------+-----------+-----------+
;11 : Last                     : -PSL<FPD> :  Nested   :  Wr Chk*  :  -Read+   :
;   : Reference                :           :   Error   :  -Intlk   :  Intlk    :
;---+--------------------------+-----------+-----------+-----------+-----------+
;12 : EALU CC                     EALU N   :  EALU Z   :  SC.ne.0  : Sign Src
```

```
;---+-----------------------------+------------+------------+------------+------------+
;13 :                             :            :            :            :            :
;---+-----------------------------+------------+------------+------------+------------+
;14 : SC  0= Zero     2= 1-31     :     0      :  SC<9:8>   :  SC.gt.0   :  SC<9:5>   :
;   :     1= Neg      3= .gt.31   :            :   .ne.0    :            :   .ne.0    :
;---+-----------------------------+------------+------------+------------+------------+
;15 : ALU1-0 (previous cycle)     : Rlog Empty :  ALU<1:0>  :  ALU<01>   :  ALU<00>   :
;   :                             :            :   .eq.0    :            :            :
;---+-----------------------------+------------+------------+------------+------------+
;16 : STATE7-4                    : STATE<7>   : STATE<6>   : STATE<5>   : STATE<4>   :
;---+-----------------------------+------------+------------+------------+------------+
;17 : STATE3-0                    : STATE<3>   : STATE<2>   : STATE<1>   : STATE<0>   :
;---+-----------------------------+------------+------------+------------+------------+
;18 : D Bytes                     : D<31:24>   : D<23:16>   :  D<15:8>   :  D<7:0>    :
;   :                             :    .ne.0   :   .ne.0    :   .ne.0    :   .ne.0    :
;---+-----------------------------+------------+------------+------------+------------+
;19 : D3-0                        :    D<03>   :   D<02>    :   D<01>    :   D<00>    :
;---+-----------------------------+------------+------------+------------+------------+
;1A : PSL CC                      :   PSL<N>   :   PSL<Z>   :   PSL<V>   :   PSL<C>   :
;---+-----------------------------+------------+------------+------------+------------+
;1B : ALU CC                      :    ALU N   :   ALU Z    :   IR<0>    :  ALU C31   :
;---+-----------------------------+------------+------------+------------+------------+



;BEN: Name           :  UPC<04>   :  UPC<03>   :  UPC<02>   :  UPC<01>   :  UPC<00>   :
;---+----------------+------------+------------+------------+------------+------------+
;1C : PSL Mode       : -VAMX<31>  : -VAMX<30>  : -Console   : -PSL<IS>*  :  Kernel    :
;   :                :            :            :   Mode     : -PSL<CM>   :   Mode     :
;---+----------------+------------+------------+------------+------------+------------+
;1D : Translation    :    PTE     :   Data     :     0      : TB Miss +  : TB Miss +  :
;   : Test           :  - Valid   :  Aligned   :            :Access Viol : 1st Modify:
;---+----------------+------------+------------+------------+------------+------------+
;1E :                :            :            :            :            :            :
;---+----------------+------------+------------+------------+------------+------------+
;1F :                :            :            :            :            :            :
;---+----------------+------------+------------+------------+------------+------------+
.PAGE   'Memory Control Functions"     ;October 11, 1976

;                    ---  trap on  ---
;         ' | F|  | 'T A       O     S|   Y = utrap on condition
;         | | U| C| |B C X A T D T   B|   * = utrap on condition unless MSC/
;         | | N| H|S|M C P L B D B C I|       SECOND.REF or RETRY.NO.TRAP
; A       .V' C| E|A|I E A I U A P P E|   N = do not utrap on condition
; D  MCT F|/| T| C|V|S S G G F D A A R|   - = hardware behaviour undefined.
; S 3210 S.P| N| K|E|S S E N M R R R R|       ucode must prevent condition
; --------+-+--+--+-+-----------------+--------------------
; 0 0000 0.V|  | R|N|N N N N N N Y N N| TEST.RCHK
; 0 0001 0|V'  |  'N|N N N N N N N N N| MEM.NOP
; 0 0010 0|V|  ' W|N|N N N N N N Y N N| TEST.WCHK
; 0 0011 0| |  | '|'|                 |
;
; 0 0100 0| '  |  '|                  |
; 0 0101 0|V| W|  |N|Y N - - N - Y N Y| WRITE.V.NOCHK
; 0 0110 0|V| W| W.Y|Y Y * * Y Y Y N Y| WRITE.V.WCHK
; 0 0111 0|V|IW|  |N|- - - - - - Y N Y| LOCKWRITE.V.XCHK
;
; 0 1000 0|V| R| R|Y|Y Y * * N Y Y Y Y| READ.V.RCHK
; 0 1001 0|V| R|  |N|Y N - - N - Y Y Y| READ.V.NOCHK
; 0 1010 0|V| R| W|Y|Y Y * * Y Y Y Y Y| READ.V.WCHK
; 0 1011 0|V| R|IB|Y|Y Y Y Y Y Y Y Y Y| READ.V.IBCHK
;
; 0 1100 0|V| R| R|N|N N N N N Y N N N| READ.V.NEWPC
; 0 1101 0|V|IR|  |N|Y N - - N - Y Y Y| LOCKREAD.V.NOCHK
; 0 1110 0|V|IR| W|Y|Y Y - - Y - Y Y Y| LOCKREAD.V.WCHK
; 0 1111 0| |  |  | |                 |
;
; 1 0000 0| |HOLD |N|N N N N N N N N N| SBI.HOLD
; 1 0001 0| |UNJAM|N|N N N N N N N N N| SBI.HOLD+UNJAM
; 1 0010 0|P|INVAL|N|N N N N N N N N N| INVALIDATE
; 1 0011 0|P| VAL |N|N N N N N N N N N| VALIDATE
;
; 1 0100 0|P|EXTWR|N'N N N N N N N N Y| EXTWRITE.P
; 1 0101 0|P|  W  |N|N N N N N N N N Y| WRITE.P
; 1 0110 0| |     | |                 |
; 1 0111 0|P|  IW |N|N N N N N N N N Y| LOCKWRITE.P
;
; 1 1000 0| |     | |                 |
; 1 1001 0|P|  R  |N|N N N N N N N Y Y| READ.P
; 1 1010 0| |     | |                 |
; 1 1011 0|P| ISR |N|N N N N N N N N Y| READ.INT.SUM
;
; 1 1100 0| |     | |                 |
; 1 1101 0|P|  IR |N|N N N N N N N Y Y| LOCKREAD.P
; 1 1110 0| |     | |                 |
; 1 1111 0|I|  R  |N|N N N N N N N N N| ALLOW.IB.READ
;
; 0 XXXX 1| |     | |N N N N N N N N N| NO MEMORY OPERATION
; 1 XXXX 1|I|  R  |N|N N N N N N N N N| DEFAULT: ALLOW IB READ
;
; Abort Ref on Trap? A A A   A A A R A (A=any, R=read)
```

```
.PAGE   "ID Bus Map"    ;September 2, 1977
.NOBIN
;  The left column lists first the ID bus register name, and in parenthesis
; its address.  If the register is also accessible by MTPR and MFPR inst-
; ructions, the Internal Register Number and symbolic name are also given.

;          31/15  30/14  29/13  28/12  27/11  26/10  25/09  24/08  23/07  22/06  21/05  20/04  19/03  18/02  17/01  16/00
;IBUF     *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;(00)     :                      Data Byte 3                      :                      Data Byte 2                      :
;         :  31  :  30  :  29  :  28  :  27  :  26  :  25  :  24  :  23  :  22  :  21  :  20  :  19  :  18  :  17  :  16  :
;         *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;         :                      Data Byte 1                      :                      Data Byte 0                      :
;         :  15  :  14  :  13  :  12  :  11  :  10  :  9   :  8   :  7   :  6   :  5   :  4   :  3   :  2   :  1   :  0   :
;         *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;         *                           *                           *                           *                           *
;DAY.TIM  *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;(01)     :                      Time Byte 3                      :                      Time Byte 2                      :
;         :  31  :  30  :  29  :  28  :  27  :  26  :  25  :  24  :  23  :  22  :  21  :  20  :  19  :  18  :  17  :  16  :
;IR 1B    *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;"TODR"   :                      Time Byte 1                      :                      Time Byte 0                      :
;         :  15  :  14  :  13  :  12  :  11  :  10  :  9   :  8   :  7   :  6   :  5   :  4   :  3   :  2   :  1   :  0   :
;         *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;         *                           *                           *                           *                           *
;SYS.ID   *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;(03)     :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :
;         :  31  :  30  :  29  :  28  :  27  :  26  :  25  :  24  :  23  :  22  :  21  :  20  :  19  :  18  :  17  :  16  :
;IR 3E    *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;"SID"    :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :  ID  :
;         :  15  :  14  :  13  :  12  :  11  :  10  :  9   :  8   :  7   :  6   :  5   :  4   :  3   :  2   :  1   :  0   :
;         *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;         *                           *                           *                           *                           *
;RXCS     *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;(04)     :      :      :      :      :      :      :      :      :      :      :      :      :      :      :      :      :
;         :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :
;IR 20    *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;"RXCS"   :      :      :      :      :      :      :      :      :      :Intrpt:      :      :      :      :      :      :
;         :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   : Done :Enable:  0   :  0   :  0   :  0   :  0   :  0   :
;         *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;         *                           *                           *                           *                           *
;RXDB     *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;(05)     :                      Data Byte 3                      :                      Data Byte 2                      :
;         :  31  :  30  :  29  :  28  :  27  :  26  :  25  :  24  :  23  :  22  :  21  :  20  :  19  :  18  :  17  :  16  :
;IR 21    *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;"RXDB"   :                      Data Byte 1                      :                      Data Byte 0                      :
;         :  15  :  14  :  13  :  12  :  11  :  10  :  9   :  8   :  7   :  6   :  5   :  4   :  3   :  2   :  1   :  0   :
;         *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;          31/15  30/14  29/13  28/12  27/11  26/10  25/09  24/08  23/07  22/06  21/05  20/04  19/03  18/02  17/01  16/00
;TXCS     *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;(06)     :      :      :      :      :      :      :      :      :      :      :      :      :      :      :      :      :
;         :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :
;IR 22    *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;"TXCS"   :      :      :      :      :      :      :      :      :      :Intrpt:      :      :      :      :      :      :
;         :  0   :  0   :  0   :  0   :  0   :  0   :  0   :  0   :Ready :Enable:  0   :  0   :  0   :  0   :  0   :  0   :
;         *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
;         *                           *                           *                           *                           *
;TXDB     *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
```

```
;(07)      !                          Data Byte 3                          !                          Data Byte 2                          !
;          !  31   !  30   !  29   !  28   !  27   !  26   !  25   !  24   !  23   !  22   !  21   !  20   !  19   !  18   !  17   !  16   !
;IR 23     *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;"TXDB"    !                          Data Byte 1                          !                          Data Byte 0                          !
;          !  15   !  14   !  13   !  12   !  11   !  10   !   9   !   8   !   7   !   6   !   5   !   4   !   3   !   2   !   1   !   0   !
;          *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;          *                               *                               *                               *                               *
;DG        *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;(08)      !                                                       D(read) Q(write)                                                        !
;          !  31   !  30   !  29   !  28   !  27   !  26   !  25   !  24   !  23   !  22   !  21   !  20   !  19   !  18   !  17   !  16   !
;          *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;          !                                                       D(read) Q(write)                                                        !
;          !  15   !  14   !  13   !  12   !  11   !  10   !   9   !   8   !   7   !   6   !   5   !   4   !   3   !   2   !   1   !   0   !
;          *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;          *                               *                               *                               *                               *
;NXT.PER   *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;(09)      !                                                         Next Interval                                                         !
;          !  31   !  30   !  29   !  28   !  27   !  26   !  25   !  24   !  23   !  22   !  21   !  20   !  19   !  18   !  17   !  16   !
;IR 19     *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;"NICR"    !                                                         Next Interval                                                         !
;          !  15   !  14   !  13   !  12   !  11   !  10   !   9   !   8   !   7   !   6   !   5   !   4   !   3   !   2   !   1   !   0   !
;          *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;          *                               *                               *                               *                               *
;CLK.CS    *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;(0A)      !       !       !       !       !       !       !       !       !       !       !       !       !       !       !       !       !
;          !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !
;IR 18     *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;"ICCS"    !       !       !       !       !       !       !       !       !Intrpt !Intrpt !Single !       !       !       !       !       !
;          ! Error !   0   !   0   !   0   !   0   !   0   !   0   !   0   !  Req  !Enable ! Clock ! Xfer  !   0   !   0   !   0   !  Run  !
;          *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;          *                               *                               *                               *                               *
;INTERVAL  *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;(0B)      !                                                     Count (microseconds)                                                      !
;          !  31   !  30   !  29   !  28   !  27   !  26   !  25   !  24   !  23   !  22   !  21   !  20   !  19   !  18   !  17   !  16   !
;IR 1A     *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;"ICR"     !                                                     Count (microseconds)                                                      !
;          !  15   !  14   !  13   !  12   !  11   !  10   !   9   !   8   !   7   !   6   !   5   !   4   !   3   !   2   !   1   !   0   !
;          *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;            31/15   30/14   29/13   28/12   27/11   26/10   25/09   24/08   23/07   22/06   21/05   20/04   19/03   18/02   17/01   16/00
;CES       *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;(0C)      !       !       !       !       !       !       !       !       !       !       !       !       !       !       !       !Nested !
;          !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   !   0   ! Error !
;IR 13     *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;"ASTR"    ! Control Store  Parity  Error  ! EALU  ! EALU  !  ALU  !  ALU  !  ALU  !      Arithmetic       ! Perf  !                       !
;IR 3D     !Summry !   2   !   1   !   0   !   N   !   Z   !   N   !   Z   !  C31  !      Trap Code        !Mon En !       AST Level       !
;"PME"     *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;          *                               *                               *                               *                               *
;VECTOR    *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;(0D)      !       !       !       !       !       !       ! Prior !                               !                                       !
;          !   0   !   0   !   0   !   0   !   0   !   0   ! Valid !           Priority            !            Number of Ones             !
;          *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;          !       !       !       !       !       !       !       !       !       !       !       ! Vector!       !       !       !       !
;          !   0   !   0   !   0   !   0   !   0   !   0   !   0   !  08   !  07   !  06   !  05   !  04   !  03   !  02   !  01   !  00   !
;          *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;          *                               *                               *                               *                               *
;SIR       *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
```

```
; ;(OE)     !         !         !         !         !         !         !         !         !         !         !         !            Interrupt Priority Level             !
; ;         !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !                     Active                      !
; ;IR 15    *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;"SISR"   !                                                             Software Interrupt Register                                                             !    0    !
; ;         !    F    !    E    !    D    !    C    !    B    !    A    !    9    !    8    !    7    !    6    !    5    !    4    !    3    !    2    !    1    !         !
; ;         *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;         *                                       *                                       *                                       *                                       *
; ;PSL      *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;(OF)     ! Compat  !  Trace  !         !         !   FPD   ! Intrpt  !      Current      !     Previous      !         !            Interrupt Priority Level             !
; ;         !  Mode   !  Pend   !    0    !    0    !         !  Stack  !       Mode        !       Mode        !    0    !                                                 !
; ;IR 12    *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;"IPL"    !         !         !         !         !         !         !         !         ! Decmal  !  Float  ! Intger  !         !            Condition Code             !
; ;         !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    ! oVrflo  ! Undflo  ! oVrflo  !    T    !    N    !    Z    !    V    !    C    !
; ;         *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;         *                                       *                                       *                                       *                                       *
; ;TBUF     *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;(10)     !         !                                       !         !         !         !         !         !         !                Page Frame Number                !
; ;         !  Valid  !            Protection Code            ! Modify  !    0    !    0    !    0    !    0    !    0    !   20    !   19    !   18    !   17    !   16    !
; ;         *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;         !                                                                       Page Frame Number                                                                       !
; ;         !   15    !   14    !   13    !   12    !   11    !   10    !    9    !    8    !    7    !    6    !    5    !    4    !    3    !    2    !    1    !    0    !
; ;         *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;           31/15     30/14     29/13     28/12     27/11     26/10     25/09     24/08     23/07     22/06     21/05     20/04     19/03     18/02     17/01     16/00
; ;TBER0    *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;(12)     !         !         !         !         !         !         !         !         !         !         !         ! Replac  !   Force Replace   !   Force TB Miss   !
; ;         !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !  Both   !   G1    !   G0    !   G1    !   G0    !
; ;         *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;         !                                Last Reference                                 !      TB Hit       !         !               Force TB                !   Mem   !
; ;         !   FS    !   ADS   !  MCT3   !  MCT2   !  MCT1   !  MCT0   ! IBWCHK  !   AR    !   G1    !   G0    !    0    !             Parity Error              ! Man En  !
; ;         *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;         *                                       *                                       *                                       *                                       *
; ;TBER1    *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;(13)     !         !         !         !         !         !         !         !         !         !         !         !              TB Parity Error Bits               !
; ;         !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !   1D2   !   1D1   !   1D0   !   0D2   !   0D1   !
; ;         *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;         !                        TB Parity Error Bits                         !  CP TB  !         !  Last   !         !   Bad   !                  IPA                  !
; ;         !   0D0   !   1A2   !   1A1   !   1A0   !   0A2   !   0A1   !   0A0   !   PE    !    0    ! TB WrP  !    0    !   IPA   !  Miss   !   PE    ! Prot E  ! Auto L  !
; ;         *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;         *                                       *                                       *                                       *                                       *
; ;ACC.MN   *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;(16)     !  Write  !         !         !         !         !         !         !         !                                 Trap Address                                  !
; ;         ! Trp Ad  !    0    !    0    !    0    !    0    !    0    !    0    !    0    !                                                                               !
; ;         *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;         !  Write  !  Micro  !         !         !         !         !         !                                   Micro-break (write)                                   !
; ;         ! uBreak  !  Match  !    0    !    0    !    0    !    0    !    0    !                                 Current Address (read)                                  !
; ;         *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;         *                                       *                                       *                                       *                                       *
; ;ACC.CS   *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;(17)     !         !         !         !         ! Resrvd  !         !         !         !         !         !         !         !         !         !         !         !
; ;         !  Error  !    0    !    0    !    0    ! Oprand  !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !
; ;IR 28    *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;"ACCS"   !  Accel  !         !         !         !         !         !         !         !         !         !         !         !           Accelerator Type            !
; ;         ! Enable  !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    0    !    1    !
; ;         *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; ;         *                                       *                                       *                                       *                                       *
; ;SILO     *---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*---------+---------+---------+---------*
; 756   ;(18)   ! After! SBI  !             SBI ID               !      SBI TAG       !           SBI             !    SBI      !
; 757   ;       ! Fault! Intlk!   4  !   3  !   2  !   1  !   0  !   2  !   1  !   0  !M3/B31!M2/B30!M1/B29!M0/B28! CNF1 ! CNF0 !
; 758   ;IR 31  *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 759   ;"SBIS" !                                                    SBI TR                                                     !
; 760   ;       !  15  !  14  !  13  !  12  !  11  !  10  '   9  !   8  !   7  !   6  !   5  !   4  !   3  !   2  !   1  !   0  !
; 761   ;       *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 762   ;       *                           *                           *                           *                           *
; 763   ;SBI.ERR*------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 764   ;(19)   !      !      !      !      !      !      !      !      !      !      !      !      !      !      !      !      !
; 765   ;       !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !
; 766   ;IR 34  *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 767   ;"SBIER"!  RDS !      !      !  CP  ! CP TO! CP TO,      !CP Err!  IB  !  IB  ! IB TO! IB TO!IB Err! Mult !  Not !      !
; 768   ;       'Int En!  CRD !  RDS !  TO  !  ST1 !  ST0 !   0  !  CNF !  RDS !  TO  !  ST1 !  ST0 !  CNF ! Error! Busy !   0  !
; 769   ;       *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 770   ;         31/15  30/14  29/13  28/12  27/11  26/10  25/09  24/08  23/07  22/06  21/05  20/04  19/03  18/02  17/01  16/00
; 771   ;TIME.ADR------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 772   ;(1A)   !     Mode    ! Prot !      !                                 Physical Address                                  !
; 773   ;       !   1  !   0  ! Check!   0  !  29  !  28  !  27  !  26  !  25  !  24  !  23  !  22  !  21  !  20  !  19  !  18  !
; 774   ;IR 35  *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 775   ;"SBITA"!                                               Physical Address                                                !
; 776   ;       !  17  !  16  !  15  !  14  !  13  !  12  !  11  !  10  !   9  !   8  !   7  !   6  !   5  !   4  !   3  !   2  !
; 777   ;       *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 778   ;       *                           *                           *                           *                           *
; 779   ;FAULT  *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 780   ;(1B)   !Parity!      ! Unexp!      ! Mult ! Xmit !      !      !      !      !      !      ! Fault! Fault! Fault! Fault!
; 781   ;       ! Fault!   0  !  RD  !   0  ! Xmit ! Fault!   0  !   0  !   0  !   0  !   0  !   0  ! Latch!Int En!Signal! Lock !
; 782   ;IR 30  *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 783   ;"SBIFS"!      !      !      !      !      !      !      !      !      !      !      !      !      !      !      !      !
; 784   ;       !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !
; 785   ;       *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 786   ;       *                           *                           *                           *                           *
; 787   ;COMP   *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 788   ;(1C)   ! Silo ! Silo ! Lock !  Cond Lock  !          Compare          !       Compare      !           Count           !
; 789   ;       ! Lock !Int En!Uncond!     Code    !      Command or Mask      !        Tag         !                           !
; 790   ;IR 32  *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 791   ;"SBISC"!      !      !      !      !      !      !      !      !      !      !      !      !      !      !      !      !
; 792   ;       !   0  !   0  !   0  !   0  !   0  !   0  '   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !
; 793   ;       *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 794   ;       *                           *                           *                           *                           *
; 795   ;MAINT  *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 796   ;(1D)   !  Rev !Wr Seq! Unexp! Mult !         Maintenance ID           , Force!Enable!    Reverse Cache Parity    ! Force!
; 797   ;       !  P0  ! Fault!  RD  ! Xmit !   4  ,   3  !   2  !   1  !   0  ! SBI Invalid !      !      !      !      !MissG0!
; 798   ;IR 33  *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 799   ;"SBIMT"! Force! Force! Force!Disabl!  Rev !  G1  !  G0  ! Force!      !      !      !      !      !      !      !      !
; 800   ;       !MissG1!Rep G0!Rep G1!  SBI !  P1  ! Match! Match!  TO  !   0  !   0  '   0  !   0  !   0  !   0  !   0  !   0  !
; 801   ;       *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 802   ;       *                           *                           *                           *                           *
; 803   ;PARITY *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 804   ;(1E)   !      !      !      !      !      !      !      !      !      !      !      !      !      !      !      !      !
; 805   ;       !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !   0  !
; 806   ;       *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 807   ;       !  Any !  CP  !                    Data Parity OK                     !           Address Parity OK             !
; 808   ;       ! Error! Error! G1 B0! G1 B1! G1 B2! G1 B3! G0 B0! G0 B1! G0 B2! G0 B3! G0 B0! G0 B1! G0 B2! G1 B0! G1 B1! G1 B2!
; 809   ;       *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
; 810   ;         31/15  30/14  29/13  28/12  27/11  26/10  25/09  24/08  23/07  22/06  21/05  20/04  19/03  18/02  17/01  16/00
; 811   ;USTACK *------+------+------+------*------+------+------+------*------+------+------+------*------+------+------+------*
```

```
;(20)       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :
;           :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :
;           *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;           :       .       :       :                                        Control Store Address                                          :
;           :       .       :       :  12   :  11   :  10   '   9   :   8   :   7   :   6   :   5   :   4   :   3   :   2   :   1   :   0   :
;           *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;           *                               *                               *                               *                               *
;UBREAK     *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;(21)       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :
;           :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   '   0   :   0   :   0   :   0   :
;IR 3C      *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;'MBRK''    :       :       :       :                                        Control Store Address                                          :
;           :   0   :   0   :   0   :  12   :  11   :  10   :   9   :   8   :   7   :   6   :   5   :   4   :   3   :   2   :   1   :   0   :
;           *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;           *                               *                               *                               *                               *
;WCS.ADDR---*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;(22)       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :       :
;           :   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   '   0   :   0   :   0   :   0   :   0   :   0   :   0   :   0   :
;IR 2C      *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;'WCSA''    :Invert :     Mod 3     :                                        Control Store Address                                          :
;           'Parity :    Counter    :  12   :  11   :  10   :   9   :   8   :   7   :   6   :   5   :   4   :   3   :   2   :   1   :   0   :
;           *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;           *                               *                               *                               *                               *
;WCS.DATA---*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;(23)       : Data  : Data  : Data  : Data  : Data  : Data  : Data  : Data  : Data  : Data  : Data  : Data  : Data  : Data  : Data  : Data  :
;           :  31   :  30   :  29   '  28   :  27   :  26   :  25   :  24   :  23   :  22   :  21   :  20   :  19   :  18   :  17   :  16   :
;IR 2D      *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;'WCSD''    : Data  : Data  : Data  : Data  : Data  : Data  : Data  : Data  , Data  : Data  : Data  : Data  : Data  : Data  : Data  : Data  :
;           :  15   :  14   :  13   :  12   :  11   :  10   '   9   :   8   :   7   :   6   :   5   :   4   :   3   :   2   :   1   :   0   :
;           *-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*-------+-------+-------+-------*
;           *                               *                               *                               *                               *


; Number of microwords used: 0, Highest= -1

        END
```

```
;                             Location / Line Number Index
; Ucode Loc'n   0       1       2       3       4       5       6       7

U 0000

No errors detected
End of microcode assembly
21 pages of listing
Used 10.27 seconds, 6 pages of core
  Symbol table: 0P
  Text strings: 0P
  Loc'n assignment: 0P
  Cross reference: 0P
```

L 2

ZZ

SI

SU

V

:

```
.NOCREF
.TOC    "Control ROM Field Definitions"         ;28 April 77
.NOBIN                  ;DON'T LEAVE LISTING SPACE FOR BINARY
.RTOL                   ;BITS NUMBERED FROM 0 ON THE RIGHT OF A FIELD
.HEXADECIMAL            ;RADIX 16

;FIELDS ARRANGED ALPHABETICALLY

ACF/=<71:70>            ;ACCELERATOR CONTROL
        NOP=0
        SYNC=1
        TRAP=2
        CONTROL=3       ;ACCELLERATOR-DEPENDENT CONTROL FUNCTION

ACM/=<57:55>            ;ACCELERATOR MISCELLANEOUS CONTROL
        PWR.UP=0
        ABORT=1         ;RETURN ACCEL TO MONITORING IRD
        POLY.DONE=6

ADS/=<47:47>            ;ADDRESS SELECT
        VA=0
        IBA=1

ALU/=<69:66>,.Default = 0F
                        ;ALU CONTROL FUNCTIONS
        A-B=00
        A-B.RLOG=01
        A-B-1=02
        INST.DEP=03                     ;INSTRUCTION DEPENDENT
        A+B+1=04
        A+B=05
        A+B.RLOG=06
        ORNOT=07                        ;A .OR. .NOT. B
        XOR=08                          ;A .XOR. B
        ANDNOT=09                       ;A .AND. .NOT. B
        NOTA=0A                         ;.NOT. A
        A+B+PSL.C=0B
        OR=0C                           ;A .OR. B
        AND=0D                          ;A .AND. B
        B=0E
        A=0F

AMX/=<81:80>            ;AMX TO ALU
        LA=0
        RAMX=1
        RAMX.SXT=2                      ;RAMX SIGN EXTENDED ACCORDING TO DT
        RAMX.0XT=3                      ;RAMX ZERO EXTENDED. 0XT(L)=0
        NOP=0                           ;NO BRANCH
        Z=1                             ; ALU Z
        ROR=2                           ;LA<1>, PSL<C>, LA<0>
        C31=3                           ; ALU C31, 0
        IRD=4                           ;BC4-2, BC4-1, BC4-0
        ACCEL=6                         ;CODE FROM ACCELERATOR
        DATA.TYPE=8                     ;(VAX MODE) *, ASRC+VSRC, ASRC+Q+D
                                        ;   0--NORMAL, 1--QUAD OR DOUBLE
                                        ;   2--FIELD,  3--ADDRESS
        END.DP1=8                       ;(-11 MODE) *, O CLASS, J CLASS+DM27
        IR2-1=9                         ;(VAX MODE) *, IR<2:1>
        PC.MODES=9                      ;(-11 MODE) *, SM47+SM57+DM47+DM57, DST R=PC
        REI=0A                          ;(VAX MODE) MODE.LSS.ASTLVL, *, *
        SRC.PC=0A                       ;(-11 MODE) SRC R=PC
        IB.TEST=0B                      ; 0--TB MISS, 1--ERROR
                                        ; 2--STALL, 3--DATA OK
        MUL=0C                          ;SC.NE.0, D<1:0>
        SIGNS=0D                        ;Q<31>, D.NE.0, D<31>
        INTERRUPT=0E                    ;AC LOW, INTERNAL INTERRUPT, INT REQ
        DECIMAL=0F                      ;0, D BYTE 0 VALID DIGIT, D2-0 NEG SIGN
;       UTRAP=10                        ;MICROTRAP DISPATCH VECTOR
        LAST.REF=11                     ;-FPD, NESTED ERROR, LOW TWO BITS:
                                        ; 0--READ INTERLOCK, 1--READ, READ CHK
                                        ; 2--WRITE, 3--READ, WRITE CHK
        EALU=12                         ;EALU N, EALU Z, SC.NEQ.0, SS
        SC=14                           ;SC<9:8>.NE.0, SC.GT.0, SC<9:5>.NE.0
        ALU1-0=15                       ;RLOG EMPTY, ALU<1:0>=0, ALU<1>, ALU<0>
                                        ; (ALU BITS FROM PREVIOUS STATE)
        STATE7-4=16                     ;STATE <7:4>
        STATE3-0=17                     ;STATE <3:0>
        D.BYTES=18                      ;BYTES 3, 2, 1, 0 OF D.NE.0
        D3-0=19                         ;D<3:0>
        PSL.CC=1A                       ;N,Z,V,C OF PSL
        ALU=1B                          ;ALU N, ALU Z, IR<0>, ALU C31
        PSL.MODE=1C                     ;-VA<31:30>, -CONSOLE, IS+CM, KERNEL
        TB.TEST=1D                      ;PTE VALID, ALIGNED, QUAD, +
                                        ; 0--TRANSLATION OK, 1--WR CHK AND M=0

BMX/=<84:82>            ;BMX TO ALU
        MASK=0                          ;A 0 IN THE BIT SELECTED BY SC<4:0>
        PC.OR.LB=1                      ;LB UNLESS R=PC, THEN PC
        PACKED.FL=2                     ;PACKED FLOATING
        LB=3
        LC=4
        PC=5
        KMX=6
        RBMX=7                          ;D OR Q
        NOP=0                                   ;DEFAULT
        LOAD.UBCC=1                             ;SAMPLE ALU & EALU CONDITIONS
        SET.V=2                                 ;FORCE V, NO EFFECT ON N, Z, C
        TST.Z=3                                 ;CLR Z IF ALU.NE.0,
                                                ; SET N FROM AMX[UDT]
        ROR=4                                   ;SET N & Z FROM ALU, C FROM AMX 00
        N+Z_ALU=5                               ;SET N AND Z FROM ALU[UDT]
        C_AMX0=6                                ;OTHERS UNAFFECTED
        INST.DEP=7

CID/=<45:42>                    ;CONSOLE & ID BUS CONTROL IF FS/1
        NOP=1                                   ;DEFAULT, ALLOW AUTO IB READ
        ACK=5                                   ;SET CONSOLE ACKNOWLEGE FLAG
        CONT=7                                  ;CLEAR CONSOLE MODE
        READ.SC=9                               ;READ ID BUS REG SELECTED BY SC
        READ.KMX=0B                             ;READ ID BUS REG SELECTED BY UKMX
        WRITE.SC=0D                             ;WRITE REG SELECTED BY SC
        WRITE.KMX=0F                            ;WRITE REG SELECTED BY UKMX

DK/=<91:88>
        NOP=0                                   ;DEFAULT, HOLD
        LEFT2=1                                 ;DOUBLE SHIFT LEFT
        RIGHT2=2                                ;DOUBLE SHIFT RIGHT
        DIV=4                                   ;IF NOT ALU CRY, SHIFT LEFT
                                                ; ELSE LOAD FROM SHF
        LEFT=5                                  ;SHIFT LEFT
        RIGHT=6                                 ;SHIFT RIGHT
        SHF=8                                   ;LOAD SHF MUX, INTEGER FORMAT
        SHF.FL=9                                ;LOAD SHF MUX, UNPACKED FLOATING FORMAT
        ACCEL=0A                                ;LOAD ACCELERATOR DATA FROM DF BUS
        BYTE.SWAP=0B                            ;REFLECT BYTES AROUND BIT 16
        Q=0C                                    ;LOAD Q THRU DAL
        DAL.SC=0D                               ;LOAD DAL[SC]
        DAL.SV=0E                               ;LOAD DAL[SHF VAL]
        CLR=0F                                  ;LOAD ZEROS

DT/=<79:78>,.DEFAULT=0  ;DATA TYPE
                        ;CONTROLS AMX SIGN/ZERO EXTENDER, SHF AMOUNT,
                        ;CONDITION CODE SETTING, AND MEMORY REFERENCES
        LONG=0                                  ;DEFAULT
        WORD=1
        BYTE=2
        INST.DEP=3                              ;INSTRUCTION DEPENDENT --
                                                ;ANY OF ABOVE, OR QUAD/DOUBLE
        A=0
        OR=1
        ANDNOT=2
        B=3
        A+B=4
        A-B=5
        A+1=6
        NABS.A-B=7                      ;-ABS(A-B)

EBMX/=<19:18>           ;EBMX TO EALU
        FE=0                            ;DEFAULT
        KMX=1
        AMX.EXP=2
        SHF.VAL=3                       ;SHIFT VALUE

FEK/=<24:24>            ;FE REGISTER CONTROL
        NOP=0                           ;DEFAULT, HOLD
        LOAD=1

FS/=<42:42>             ;FUNCTION SELECT FOR 43-46
        MCT=0                           ;ENABLE MEMORY CONTROL
        CID=1                           ;ENABLE ID BUS AND CONSOLE CONTROL

IEK/=<31:30>            ;INTERRUPT AND EXCEPTION ACKNOWLEDGE
        NOP=0
        ISTR=1                          ;STROBE INTERRUPT REQUESTS
        IACK=2                          ;INTERRUPT ACKNOWLEDGE
        EACK=3                          ;EXCEPTION ACKNOWLEDGE

IBC/=<95:92>            ;IBUF CONTROL FUNCTIONS
        NOP=0                           ;DEFAULT
        STOP=1
        FLUSH=2                         ;FLUSH IB AND LOAD IBA
        START=3
        CLR.0.1=4                       ;CLEAR BYTES 0,1 (-11 OPCODE)
        CLR.2.3=5                       ;CLEAR BYTES 2,3 (-11 ISTREAM DATA)
        BDEST=7                         ;TRANSFER BRANCH DISPLACEMENT
        CLR.0=0C                        ;CLEAR BYTE 0 (VAX OPCODE)
        CLR.1=0D                        ;CLEAR BYTE 1 (VAX SPECIFIER)
        CLR.0-3=0E                      ;CLEAR BYTES 0-3 (-11 OP & DATA)
        CLR.1-5.COND=0F                 ;CLEAR BYTES 1-5 CONDITIONALLY
                                        ; IF THERE IS NO SPECIFIER EVALUATION,
                                        ; CLEAR NOTHING.  IF A SELF-CONTAINED
                                        ; SPECIFIER, CLEAR IT.  IF IMMEDIATE,
                                        ; ABSOLUTE, OR DISPLACEMENT, CLEAR THE
                                        ; ISTREAM LITERAL.
        IBUF=0                  ;RD     ;SPECIFIER/LITERAL DATA FROM IB
        DAY.TIME=1              ;RD+WR  ;CURRENT TIME OF DAY...
                                        ; MUST READ UNTIL STOPS CHANGING
        SYS.ID=3                ;RD     ;SYSTEM IDENTIFICATION
        RXCS=4                  ;RD+WR  ;CONSOLE RECIEVE CONTROL/STATUS
        RXDB=5                  ;RD     ;CONSOLE RECIEVE DATA BUFFER
                                        ; (TO-ID REGISTER)
        TXCS=6                  ;RD+WR  ;CONSOLE TRANSMIT CONTROL/STATUS
        TXDB=7                  ;WR     ;CONSOLE TRANSMIT DATA BUFFER
                                        ; (FROM-ID REGISTER)
;       DQ=8                            ;DATA PATH D/Q REGISTERS (MAINT ONLY)
        NXT.PER=9               ;WR     ;INTERVAL CLOCK NEXT PERIOD REGISTER
        CLK.CS=0A               ;RD+WR  ;INTERVAL CLOCK CONTROL/STATUS
        INTERVAL=0B             ;RD     ;CURRENT INTERVAL COUNT
        CES=0C                  ;RD+WR  ;CPU ERROR/STATUS
        VECTOR=0D               ;RD+WR  ;EXCEPTION & INTERRUPT CONTROL
        SIR=0E                  ;RD+WR  ;SOFTWARE INTERRUPT REGISTER
        PSL=0F                  ;RD+WR  ;PROCESSOR STATUS LONGWORD
        TBUF=10                         ;TRANSLATION BUFFER DATA
        TBER0=12                        ;TB ERROR/STATUS 0
        TBER1=13                        ;TB ERROR/STATUS 1
        ACC.0=14                        ;ACCELERATOR REGISTER #0
        ACC.1=15                        ;ACCELERATOR REGISTER #1
        ACC.2=16                        ;ACCELERATOR REGISTER #2
        ACC.CS=17                       ;ACCELERATOR CONTROL/STATUS
        SILO=18                         ;NEXT ITEM FROM SBI HISTORY
        SBI.ERR=19                      ;SBI ERROR REGISTER
        TIME.ADDR=1A                    ;SBI TIMEOUT ADDRESS
        FAULT=1B                        ;FAULT/STATUS
        COMP=1C                         ;SBI SILO COMPARATOR
        MAINT=1D                        ;SBI MAINTENANCE
        PARITY=1E                       ;CACHE PARITY
        USTACK=20                       ;MICROSTACK
        UBREAK=21                       ;MICRO BREAK
        WCS.ADDR=22
        WCS.DATA=23             ;WR     ;WRITING WCS COUNTS ADDRESS
        P0BR=24                         ;PROCESS SPACE 0 BASE REGISTER
        P1BR=25                         ;PROCESS SPACE 1 BASE REGISTER
        SBR=26                          ;SYSTEM SPACE BASE REGISTER
        KSP=28                          ;KERNEL STACK POINTER
        ESP=29                          ;EXEC STACK POINTER
        SSP=2A                          ;SUPERVISOR STACK POINTER
        USP=2B                          ;USER STACK POINTER
        ISP=2C                          ;INTERRUPT STACK POINTER
        FPDA=2D
        D.SV=2E
        Q.SV=2F
        T0=30                           ;GENERAL TEMPS
        T1=31
        T2=32
        T3=33
        T4=34
        T5=35
        T6=36
        T7=37
        T8=38
        T9=39
        PCBB=3A                         ;PROCESS CONTROL BLOCK BASE
        SCBB=3B                         ;SYSTEM CONTROL BLOCK BASE
        P0LR=3C                         ;PROCESS 0 LENGTH REGISTER
        P1LR=3D                         ;PROCESS 1 LENGTH REGISTER
        SLR=3E                          ;SYSTEM LENGTH REGISTER

J/=<12:0>,.nextaddress  ;NEXT MICRO WORD ADDRESS, DEFAULT IS THE
                        ;FOLLOWING MICRO WORD
                        ;SYMBOLS ARE DEFINED BY ":"
        .8=0                            ;#8 FROM FK
        .1=1                            ;#1 FROM FK
        .2=2                            ;#2 FROM FK
        .3=3                            ;#3 FROM FK
        .4=4                            ;#4 FROM FK
        SP1.CON=5                       ;SPECIFIER 1 CONSTANT
        SP2.CON=6                       ;SECIFIER 2 CONSTANT (-11 MODE)
        ZERO=6                          ; OR ZEROS (VAX MODE)
        SC=7                            ;SC[9:0] FROM FK
                        ;8 - 3F: CONSTANTS (1 CYCLE SETUP IF ALU IN ARITH MODE)
                                ;DECIMAL VALUE OF CONSTANT
        .14=8                           ;20     (AF,JL,MH)
        .A0=9                           ;160    (AF,JL)
        .34=0A                          ;52     (AF)
        .28=0B                          ;40     (AF)
        .40=0C                          ;64     (AF,JL,MH,TF)
        .50=0D                          ;80     (AF,MH)
;       .3000=0E                        ;12288  (JL)
        .EF=0F                          ;239    (JL)
        .80=10                          ;128    (AF,JL,MH,TF)
        .8000=11                        ;-32768 (AF)
        .FF=12                          ;255    (MH,TF)
        .FF00=13                        ;-256   (MH,AF,JL)
        .1E=14                          ;30     (AF)
        .3F=15                          ;63     (MH,AF,TF)
        .7F=16                          ;127
        .7=17                           ;7      (AF,MH)
        .F=18                           ;15     (MH,CM,AF,TF)
        .10=19                          ;16     (MH,AF,JL,TF)
        .FFE8=1A                        ;-24    (MH,TF)
        .FFF0=1B                        ;-16    (CM,JL,TF,MH)
        .FFF8=1C                        ;-8     (CM,TF,MH)
        .20=1D                          ;32     (CM,JL,MH,TF)
        .30=1E                          ;48     (CM,AF,MH,TF)
        .18=1F                          ;24     (MH,AF,TF)
        .3FF=20                         ;1023   (CM)
        .C=21                           ;12     (CM,JL,TF,MH)
        .D=22                           ;13     (TF)
        .1F=23                          ;31     (AF,JL,MH,TF)
        .1F00=24                        ;7936   (JL,MH)
        .B0=25                          ;176    (MH)
        .E003=26                        ;       (CM)
        .7C=27                          ;124    (AF)
        .FFE0=28                        ;-32    (JL)
        .60=29                          ;96     (TF)
;       SPARE=2A
        .DFCF=2B                        ;?      (JL)
;       .FFEF=2C                        ;-17    (AF)
        .FFF1=2D                        ;-15    (AF)
        .19=2E                          ;25     (AF)
        .FFF9=2F                        ;-7     (AF)
        .FFFF=30                       ;-1     (MH,JL,TF)
        .88=31                         ;136    (AF)
        .3030=32                       ;?      (TF)
        .F0=33                         ;240    (TF)
        .C0=34                         ;192    (TF,MH)
        .6=35                          ;6      (CM,JL,TF)
        .9=36                          ;9      (CM)
        .FFF6=37                       ;-10    (CM)
        .FFF5=38                       ;-11    (CM)
        .1A=39                         ;26     (CM,AF,TF)
        .24=3A                         ;36     (CM,MH)
        .1B=3B                         ;27     (CM,AF,TF)
        .FFFC=3C                       ;-4     (CM,TF,MH)
        .A=3D                          ;10     (AF,MH)
        .7E=3E                         ;126    (AF,TF)
;       SPARE=3F
```

```
        TEST.RCHK=00                    ;TEST TBUF WITH READ CHECK
        MEM.NOP=02                      ;NEITHER CPU NOR IB GETS MEM CYCLE
        TEST.WCHK=04                    ;TEST TBUF WITH WRITE CHECK
        WRITE.V.NOCHK=0A                ;WRITE, INHIBIT TRAPS
        WRITE.V.WCHK=0C                 ;WRITE, NORMAL VARIETY
        LOCKWRITE.V.XCHK=0E             ;INTERLOCK WRITE, VIRTUAL ADDRESS
        READ.V.RCHK=10                  ;READ, NORMAL VARIETY
        READ.V.NOCHK=12                 ;READ, INHIBIT TRAPS
        READ.V.WCHK=14                  ;READ FOR MODIFY
        READ.V.IBCHK=16                 ;READ, CHECK CONTROLLED BY IBUFFER
        READ.V.NEWPC=18                 ;BEGIN NEW INSTRUCTION STREAM
                                        ; DATA GOES TO INSTRUCTION BUFFER
        LOCKREAD.V.NOCHK=1A             ;INTERLOCK READ, INHIBIT CHECK
        LOCKREAD.V.WCHK=1C              ;INTERLOCK READ, NORMAL VARIETY
        SBI.HOLD=20                     ;STOP ALL SBI ACTIVITY
        SBI.HOLD+UNJAM=22               ;RESET SBI
        INVALIDATE=24                   ;CLEAR CACHE ENTRIES
        VALIDATE=26                     ;MICRODIAGNOSTIC FORCE VALID
        EXTWRITE.P=28                   ;EXTENDED WRITE TO CLEAR MOS ERRORS
        WRITE.P=2A                      ;WRITE, PHYSICAL
        LOCKWRITE.P=2E                  ;INTERLOCK WRITE, PHYSICAL
        READ.P=32                       ;READ, PHYSICAL
        READ.INT.SUM=36                 ;INTERRUPT SUMMARY READ
        LOCKREAD.P=3A                   ;INTERLOCK READ, PHYSICAL
        ALLOW.IB.READ=3E                ;GIVE IB A CYCLE IF IT WANTS ONE

MSC/=<29:26>
        NOP=0                           ;DEFAULT
        CHK.CHM=01                      ;CREATE NEW PSL FOR CHM
        CHK.FLT.OPR=02                  ;UTRAP IF ALU<15>=1, ALU<14:7>=0
        CHK.ODD.ADDR=03
        IRD=04                          ;THIS STATE IS INSTRUCTION DECODE
        LOAD.STATE=05
        LOAD.ACC.CC=06                  ;TAKE CONDITION CODES FROM ACCELERATOR
        READ.RLOG=07                    ;(AND POP RLOG STACK)
        CLR.FPD=08                      ;CLEAR PSL<FPD> BIT
        SET.FPD=09                      ;SET SAME
        CLR.NEST.ERR=0A                 ;CLR NESTED ERROR FLAG IN CPU STATUS
        SET.NEST.ERR=0B                 ;SET SAME
        SECOND.REF=0C                   ;OF UNALIGNED DATA REFERENCE
        RETRY.NO.TRAP=0D                ;APPLY SAVED CONTEXT, INHIBIT TRAPS
        RETRY.TRAP=0E                   ;APPLY SAVED CONTEXT TO THIS REF
        INH.CM.ADDR=0F                  ;ALLOW USE OF FULL 32-BIT ADDRESS
        NOP=0                           ;DEFAULT
        PC_VA=1
        PC_IBA=2
        VA+4=3                          ;VA_VA+4
        PC+1=4                          ;PC_PC+1
        PC+2=5                          ;PC_PC+2
        PC+4=6                          ;PC_PC+4
        PC+N=7                          ;PC_PC+N,  N IS DETERMINED BY INSTR BUFFER

QK/=<54:51>
        NOP=0                           ;DEFAULT, HOLD
        LEFT2=1                         ;DOUBLE SHIFT LEFT 2
        RIGHT2=2                        ;DOUBLE SHIFT RIGHT 2
        LEFT=5
        RIGHT=6
        SHF=8                           ;LOAD SHF, INTEGER FORMAT
        SHF.FL=9                        ;LOAD SHF, UNPACKED FLOATING FORMAT
        DEC.CON=0A                      ;DECIMAL CONSTANT = 6'S IN EACH NIBBLE
                                        ; FOR WHICH ALU CRY OUT IS FALSE
        ACCEL=0B                        ;LOAD ACCELERATOR DATA FROM DF BUS
        D=0C
        ID=0E                           ;LOAD ID BUS
        CLR=0F                          ;LOAD ZERO

RAMX/=<77:77>           ;DATA PATH MIXER TO AMX
        D=0                             ;DEFAULT
        Q=1
RBMX/=<77:77>           ;DATA PATH MIXER TO BMX.  SAME BIT AS RAMX
        Q=0
        D=1
        NOP=0                           ;DEFAULT, HOLD
        LOAD=1                          ;LOAD SMX<09:00>

SGN/=<50:48>            ;SIGN CONTROLS
        NOP=0                           ;DEFAULT
        LOAD.SS=1                       ;SS_ALU<15>
        SS.FROM.SD=2                    ;SS_SD
        NOT.SD=3                        ;SD_NOT SD
        SD.FROM.SS=4                    ;SD_SS
        SS.XOR.ALU=5                    ;SD_ALU<15>, SS_SS.XOR.ALU<15>
        ADD.SUB=6                       ;SD_ALU<15>, SS_SS.XOR.ALU<15>.XOR.IR<1>
        CLR.SD+SS=7                     ;CLEAR BOTH

SHF/=<87:85>            ;ALU SHIFTER CONTROLS
        ALU=0                           ;DEFAULT, SHF_ALU
        LEFT=1                          ;SHF_ALU(L1), INSERT SI CNTL
        RIGHT=2                         ;SHF_ALU(R1), INSERT SI CNTL
        ALU.DT=3                        ;SHF_ALU(DT: L0,L1,L2,L3), INSERT 0
        RIGHT2=4                        ;SHF_ALU(R2), INSERT SI CNTL
        LEFT3=5                         ;SHF_ALU(L3)

SI/=<57:55>,.default = 3                ;SHIFT INPUT CONTROLS
                                        ;       SHF     D       Q
                                        ;       ---     -       -
        DIVD=0                          ;       PSL<N>  Q31     ALU C31
        ASHR=1                          ;       ALU 31  Q0      Q31
        ASHL=2                          ;       0       0       D31
        ZERO=3                          ;       0       0       0
;       SPARE=4
        DIV=5                           ;       Q31     Q31     ALU C31
        MUL+=6                          ;       0       ALU 0,1 0
        MUL-=7                          ;       1       ALU 0,1 1

SMX/=<17:16>            ;MIXER TO SC
        EALU=0                          ;EALU <9:0>
        FE=1                            ;FE<9:0>
        ALU=2                           ;ALU<09:00>
        ALU.EXP=3                       ;ALU<14:07>
        NOP=0                           ;DEFAULT
        LOAD.LC.SC=6                    ;LOAD LC, ADR=SC[03:00]
        WRITE.RC.SC=7                   ;WRITE RC, ADR=SC[03:00]

SPO.AC/=<41:38>         ;4 FUNCTION BITS OF SPO FIELD
        LOAD.LAB=1                      ;LOAD LA, LB FROM R(ACN)
        LOAD.LA=2                       ;LOAD LA RN, HOLD LB
        WRITE.RAB=3                     ;WRITE RA, RB (ACN)

SPO.ACN/=<37:35>                ;AC NUMBER IN SPO FIELD
                                ;VAX MODE       RA              RB
        SP1.SP1=0                       ;0      SP1 R           SP1 R
        SP2.SP2=1                       ;1      SP2 R           SP2 R
        SP2.SP1=2                       ;2      SP2 R           SP1 R
        PRN=3                           ;3      PRN             PRN
        PRN+1=4                         ;4      PRN+1           PRN+1
        SC=5                            ;5      SC<03:00>       SC<03:00>
        SP1+1=6                         ;6      SP1 R+1         SP1 R+1

SPO.ACN11/=<37:35>      ;AC NUMBER IN SPO FIELD -- 11 MODE
                                ;-11 MODE       RA              RB
        SRC.SRC=0                       ;0      SRC R           SRC R
        DST.DST=1                       ;1      DST R           DST R
        DST.SRC=2                       ;2      DST R           SRC R
        ;SRC.SRC=3                      ;3      SRC R           SRC R
        SRC.OR.1=4                      ;4      SRC R .OR. 1    SRC R .OR. 1
        SC=5                            ;5      SC<03:00>       SC<03:00>

SPO.R/=<41:39>          ;SCRATCH PAD FUNCS WITH LOW 4 BITS OF SP AS ADR
        LOAD.LC=2                       ;LOAD LC, ADR=SPO.RN
        WRITE.RC=3                      ;WRITE RC
        LOAD.LAB=4                      ;LOAD LA, LB
        WRITE.RAB=5                     ;WRITE RA, RB
        LOAD.LAB1.WRITE.RC=6            ;LOAD LA, LB[R1], AND WRITE RC[RN]
        LOAD.LC.WRITE.RAB1=7            ;LOAD LC[RN], AND WRITE RA, RB[R1]
        R0=0
        R1=1
        R2=2
        R3=3
        R4=4
        R5=5
        R6=6
        R7=7
        AP=0C                   ;R12 = ARGUMENT LIST POINTER
        FP=0D                   ;R13 = STACK FRAME POINTER
        SP=0E                   ;R14 = STACK POINTER
        R15=0F                  ;R15 = PC, TO SOFTWARE, SCRATCH TO UCODE
SPO.RC/=<38:35>         ;RC LOCATIONS
        T0=0
        T1=1
        T2=2
        T3=3
        T4=4
        T5=5
        T6=6
        T7=7
        LC.SV=8                         ;MEM MGMT SAVES LC HERE
        VA.SV=9
        PTE.VA=0A
        PTE.PA=0B
        PC.SV=0C
        SC.SV=0D
        VA.REF=0E
        MBIT.VA=0F
        PTE.MASK=0F

SUB/=<65:64>            ;SUBROUTINE CONTROL
        NOP=0                           ;DEFAULT
        CALL=1                          ;PUSH UPC OF THIS MICROINSTRUCTION
                                        ; ONTO USTACK
        RET=2                           ;"OR" TOP OF USTACK TO UPC
                                        ; AND POP USTACK
        SPEC=3                          ;REPLACE LOW 8 BITS OF NEXT
                                        ; UPC WITH SPECIFIER DECODE FROM

VAK/=<25:25>
        NOP=0                           ;DEFAULT
        LOAD=1                          ;LOAD VA

.BIN                    ;RE-ENABLE LISTING SPACE FOR BINARY OUTPUT
.LIST
```

M 3

```
.NOBIN          ;DON'T NEED ROOM FOR BINARY IN MACRO DEFINITIONS

;ALU_0... THRU ALU_D.AND...

ALU_0(A)        ''AMX/RAMX.OXT,DT/LONG,ALU/A''
ALU_0[]D        ''ALU/@1,AMX/RAMX.OXT,LONG,BMX/RBMX,RBMX/D''
ALU_0-D         ''AMX/RAMX.OXT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A-B''
ALU_0-D-1       ''AMX/RAMX.OXT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A-B-1''
ALU_0+D         ''AMX/RAMX.OXT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A+B''
ALU_0-K[]       ''AMX/RAMX.OXT,DT/LONG,KMX/@1,BMX/KMX,ALU/A-B''
ALU_0-K[]-1     ''KMX/@1,BMX/KMX,AMX/RAMX.OXT,DT/LONG,ALU/A-B-1''
ALU_0+K[]       ''KMX/@1,BMX/KMX,AMX/RAMX.OXT,DT/LONG,ALU/A+B''
ALU_0+K[]+1     ''KMX/@1,BMX/KMX,AMX/RAMX.OXT,DT/LONG,ALU/A+B+1''
ALU_0+LB+1      ''AMX/RAMX.OXT,DT/LONG,BMX/LB,ALU/A+B+1''
ALU_0+LC        ''AMX/RAMX.OXT,DT/LONG,BMX/LC,ALU/A+B''
ALU_0-LC        ''AMX/RAMX.OXT,DT/LONG,BMX/LC,ALU/A-B''
ALU_0+LC+1      ''AMX/RAMX.OXT,DT/LONG,BMX/LC,ALU/A+B+1''
ALU_0-LC-1      ''AMX/RAMX.OXT,DT/LONG,BMX/LC,ALU/A-B-1''
ALU_0+MASK+1    ''AMX/RAMX.OXT,DT/LONG,BMX/MASK,ALU/A+B+1''
ALU_0+Q         ''AMX/RAMX.OXT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A+B''
ALU_0-Q         ''AMX/RAMX.OXT,DT/LONG,RBMX/Q,BMX/PBMX,ALU/A-B''
ALU_0-Q-1       ''AMX/RAMX.OXT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A-B-1''
ALU_0+Q+1       ''AMX/RAMX.OXT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A+B+1''
ALU_-1          ''AMX/RAMX.OXT,DT/LONG,ALU/NOTA''
ALU_D           ''RAMX/D,AMX/RAMX,ALU/A''
ALU_D.OXT[]     ''RAMX/D,AMX/RAMX.OXT,DT/@1,ALU/A''
ALU_D.OXT[].AND.K[]       ''RAMX/D,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/AND''
ALU_D.OXT[].ANDNOT.K[]  ''ALU/ANDNOT,AMX/RAMX.OXT,DT/@1,RAMX/D,BMX/KMX,KMX/@2''
ALU_D.OXT[]+K[] ''RAMX/D,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/A+B''
ALU_D.OXT[]-K[] ''RAMX/D,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/A-B''
ALU_D.OXT[]+LC  ''ALU/A+B,AMX/RAMX.OXT,DT/@1,RAMX/D,BMX/LC''
ALU_D.OXT[]+Q   ''ALU/A+B,AMX/RAMX.OXT,DT/@1,RAMX/D,BMX/RBMX,RBMX/Q''
ALU_D.OXT[]-Q   ''RAMX/D,AMX/RAMX.OXT,DT/@1,RBMX/Q,BMX/RBMX,ALU/A-B''
ALU_D.AND.K[]   ''RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND''
ALU_D.AND.MASK  ''RAMX/D,AMX/RAMX,BMX/MASK,ALU/AND''
ALU_D.ANDNOT.K[]        ''RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/ANDNOT''
ALU_D.ANDNOT.MASK       ''RAMX/D,AMX/RAMX,BMX/MASK,ALU/ANDNOT''
ALU_D.ANDNOT.Q  ''RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/ANDNOT''
```

```
ALU_D(B)        "RBMX/D,BMX/RBMX,ALU/B"
ALU_D[]K[]      "RAMX/D,AMX/RAMX,KMX/@2,BMX/KMX,ALU/@1"
ALU_D+K[]       "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B"
ALU_D-K[]       "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B"
ALU_D+K[]+1     "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B+1"
ALU_D-K[]-1     "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B-1"
ALU_D-LB        "RAMX/D,AMX/RAMX,BMX/LB,ALU/A-B"
ALU_D[]LC       "RAMX/D,AMX/RAMX,BMX/LC,ALU/@1"
ALU_D+LC        "RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B"
ALU_D-LC        "RAMX/D,AMX/RAMX,BMX/LC,ALU/A-B"
ALU_D-LC-1      "RAMX/D,AMX/RAMX,BMX/LC,ALU/A-B-1"
ALU_D+LC+PSL.C  "RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B+PSL.C"
ALU_D.OR.K[]    "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR"
ALU_D.OR.LC     "RAMX/D,AMX/RAMX,BMX/LC,ALU/OR"
ALU_D.ORNOT.MASK        "RAMX/D,AMX/RAMX,BMX/MASK,ALU/ORNOT"
ALU_D.OR.Q      "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/OR"
ALU_D[]Q        "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/@1"
ALU_D+Q         "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B"
ALU_D-Q         "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A-B"
ALU_D+Q+1       "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B+1"
ALU_D-Q-1       "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A-B-1"
ALU_D+Q+PSL.C   "ALU/A+B+PSL.C,AMX/RAMX,BMX/RBMX,RBMX/Q,RAMX/D"
ALU_D.SXT[]     "RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A"
ALU_D.SXT[].AND.K[]     "RAMX/D,AMX/RAMX.SXT,DT/@1,KMX/@2,BMX/KMX,ALU/AND"
ALU_D.SXT[]+K[] "RAMX/D,AMX/RAMX.SXT,DT/@1,KMX/@2,BMX/KMX,ALU/A+B"
ALU_D.XOR.K[]   "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/XOR"
ALU_D.XOR.LC    "RAMX/D,AMX/RAMX,BMX/LC,ALU/XOR"
ALU_D.XOR.Q     "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/XOR"
ALU_D.XOR.R[]   "RAMX/D,AMX/RAMX,SPO.R/LOAD.LAB,SPO.RAB/@1,BMX/LB,ALU/XOR"
ALU_D.XOR.RC[]  "RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/XOR"
```

```
ALU_K[]             "KMX/@1,BMX/KMX,ALU/B"
ALU_LA              "AMX/LA,ALU/A"
ALU_LA.AND.K[]      "AMX/LA,KMX/@1,BMX/KMX,ALU/AND"
ALU_LA.ANDNOT.K[]           "AMX/LA,KMX/@1,BMX/KMX,ALU/ANDNOT"
ALU_LA.ANDNOT.MASK          "AMX/LA,BMX/MASK,ALU/ANDNOT"
ALU_LA.XOR.LC       "AMX/LA,BMX/LC,ALU/XOR"
ALU_LA[]D           "AMX/LA,RBMX/D,BMX/RBMX,ALU/@1"
ALU_LA-D            "AMX/LA,RBMX/D,BMX/RBMX,ALU/A-B"
ALU_LA-D-1          "AMX/LA,RBMX/D,BMX/RBMX,ALU/A-B-1"
ALU_LA+K[]          "AMX/LA,KMX/@1,BMX/KMX,ALU/A+B"
ALU_LA-K[]          "AMX/LA,KMX/@1,BMX/KMX,ALU/A-B"
ALU_LA+K[]+1        "ALU/A+B+1,AMX/LA,BMX/KMX,KMX/@1"
ALU_LA+K[].RLOG     "AMX/LA,KMX/@1,BMX/KMX,ALU/A+B.RLOG"
ALU_LA-K[].RLOG     "AMX/LA,KMX/@1,BMX/KMX,ALU/A-B.RLOG"
ALU_LA[]LB          "AMX/LA,BMX/LB,ALU/@1"
ALU_LA+LC           "ALU/A+B,AMX/LA,BMX/LC"
ALU_LA[]Q           "AMX/LA,RBMX/Q,BMX/RBMX,ALU/@1"
ALU_LA+Q            "ALU/A+B,AMX/LA,BMX/RBMX,RBMX/Q"
ALU_LA-Q            "ALU/A-B,AMX/LA,BMX/RBMX,RBMX/Q"
ALU_LA-Q-1          "ALU/A-B-1,AMX/LA,BMX/RBMX,RBMX/Q"
ALU_LB              "BMX/LB,ALU/B"
ALU_LC              "BMX/LC,ALU/B"
ALU_NOT.D           "ALU/NOTA,AMX/RAMX,RAMX/D"
ALU_NOT.RC[]        "SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,AMX/RAMX.OXT,DT/LONG,ALU/ORNOT"
ALU_PACK.FP         "BMX/PACKED.FL,ALU/B"
ALU_PC              "BMX/PC,ALU/B"
```

```
ALU_Q           ''RAMX/Q,AMX/RAMX,ALU/A''
ALU_Q.OXT[]     ''RAMX/Q,AMX/RAMX.OXT,DT/@1,ALU/A''
ALU_Q.OXT[].ANDNOT.K[]  ''ALU/ANDNOT,AMX/RAMX.OXT,DT/@1,RAMX/Q,BMX/KMX,KMX/@2''
ALU_Q.OXT[].OR.K[]      ''ALU/OR,AMX/RAMX.OXT,DT/@1,RAMX/Q,BMX/KMX,KMX/@2''
ALU_Q.OXT[].OR.D        ''ALU/OR,AMX/RAMX.OXT,DT/@1,RAMX/Q,BMX/RBMX,RBMX/D''
ALU_Q.OXT[]+D   ''ALU/A+B,AMX/RAMX.OXT,DT/@1,BMX/RBMX,RBMX/D,RAMX/Q''
ALU_Q.OXT[]+D+1 ''ALU/A+B+1,AMX/RAMX.OXT,DT/@1,BMX/RBMX,RAMX/Q,RBMX/D''
ALU_Q.OXT[]+K[] ''ALU/A+B,AMX/RAMX.OXT,DT/@1,RAMX/Q,BMX/KMX,KMX/@2''
ALU_Q.OXT[]-K[] ''ALU/A-B,AMX/RAMX.OXT,DT/@1,RAMX/Q,BMX/KMX,KMX/@2''
ALU_Q.AND.K[]   ''RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND''
ALU_Q.ANDNOT.MASK       ''RAMX/Q,AMX/RAMX,BMX/MASK,ALU/ANDNOT''
ALU_Q.ANDNOT.K[]        ''RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/ANDNOT''
ALU_Q(B)        ''RBMX/Q,BMX/RBMX,ALU/B''
ALU_Q[]D        ''RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/@1''
ALU_Q-D         ''RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B''
ALU_Q-D-1       ''ALU/A-B-1,AMX/RAMX,RAMX/Q,BMX/RBMX,RBMX/D''
ALU_Q+K[]       ''RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B''
ALU_Q-K[]       ''RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B''
ALU_Q+K[]+1     ''ALU/A+B+1,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/@1''
ALU_Q+LB        ''RAMX/Q,AMX/RAMX,BMX/LB,ALU/A+B''
ALU_Q-LB        ''RAMX/Q,AMX/RAMX,BMX/LB,ALU/A-B''
ALU_Q+LB+1      ''RAMX/Q,AMX/RAMX,BMX/LB,ALU/A+B+1''
ALU_Q+LC        ''RAMX/Q,AMX/RAMX,BMX/LC,ALU/A+B''
ALU_Q-LC        ''RAMX/Q,AMX/RAMX,BMX/LC,ALU/A-B''
ALU_Q+LC+1      ''ALU/A+B+1,AMX/RAMX,RAMX/Q,BMX/LC''
ALU_Q+MASK      ''ALU/A+B,AMX/RAMX,RAMX/Q,BMX/MASK''
ALU_Q-MASK-1    ''ALU/A-B-1,AMX/RAMX,RAMX/Q,BMX/MASK''
ALU_Q.OR.K[]    ''RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR''
ALU_Q.OR.LC     ''RAMX/Q,AMX/RAMX,BMX/LC,ALU/OR''
ALU_Q.ORNOT.K[] ''ALU/ORNOT,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/@1''
ALU_Q.SXT[]     ''ALU/A,AMX/RAMX.SXT,DT/@1,RAMX/Q''
ALU_Q.SXT[].ANDNOT.K[]  ''ALU/ANDNOT,AMX/RAMX.SXT,RAMX/Q,BMX/KMX,KMX/@2,DT/@1''
ALU_Q.SXT[]+K[] ''RAMX/Q,AMX/RAMX.SXT,DT/@1,KMX/@2,BMX/KMX,ALU/A+B''
ALU_Q.SXT[]+LB  ''RAMX/Q,AMX/RAMX.SXT,DT/@1,BMX/LB,ALU/A+B''
ALU_Q.SXT[]+PC  ''RAMX/Q,AMX/RAMX.SXT,DT/@1,BMX/PC,ALU/A+B''
ALU_Q.XOR.D     ''RAMX/Q,AMX/RAMX,BMX/RBMX,RBMX/D,ALU/XOR''
ALU_Q.XOR.K[]   ''RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/XOR''
ALU_Q.XOR.LC    ''RAMX/Q,AMX/RAMX,BMX/LC,ALU/XOR''
ALU_R[]         ''SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A''
ALU_R[].AND.K[] ''SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/AND''
ALU_R[].ANDNOT.MASK     ''SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,BMX/MASK,ALU/ANDNOT''
ALU_R(DST)      ''SPO.AC/LOAD.LAB,SPO.ACN11/DST.DST,AMX/LA,ALU/A''
ALU_R[].OR.K[]  ''SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/OR''
ALU_R[].ORNOT.K[] ''ALU/ORNOT,AMX/LA,BMX/KMX,SPO.R/LOAD.LAB,SPO.RAB/@1,KMX/@2''
ALU_R[].XOR.K[] ''SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/XOR''
ALU_RC[]        ''SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B''
ALU_RC(SC)      ''SPO/LOAD.LC.SC,BMX/LC,ALU/B''
ALU_R(SP1)+K[].RLOG     ''SPO.AC/LOAD.LAB,SPO.ACN/SP1.SP1,AMX/LA,KMX/@1,BMX/KMX,ALU/A+B.RLOG''

CACHE_D[]       ''VAK/NOP,MCT/WRITE.V.WCHK,DT/@1,DK/NOP''
CACHE[]_D       ''VAK/NOP,MCT/WRITE.V.WCHK,MSC/@1,DK/NOP''
CACHE_D.INST.DEP        ''VAK/NOP,MCT/WRITE.V.WCHK,DT/INST.DEP,DK/NOP''
CACHE_D[].NOCHK ''VAK/NOP,MCT/WRITE.V.NOCHK,DT/@1,DK/NOP''
CACHE_P_D[]     ''VAK/NOP,MCT/WRITE.P,DT/@1,DK/NOP''
CACHE_D[].LK    ''VAK/NOP,MCT/LOCKWRITE.V.XCHK,DT/@1,DK/NOP''
```

```
D_0             "DK/CLR"
D_0-D           "AMX/RAMX.OXT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,DK/SHF"
D_0+K[]+1       "AMX/RAMX.OXT,DT/LONG,KMX/@1,BMX/KMX,ALU/A+B+1,SHF/ALU,DK/SHF"
D_0+LC+1        "AMX/RAMX.OXT,DT/LONG,BMX/LC,ALU/A+B+1,SHF/ALU,DK/SHF"
D_0-Q           "AMX/RAMX.OXT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU,DK/SHF"
D_ACCEL&SYNC    "DK/ACCEL,ACF/SYNC"
D_ALU           "SHF/ALU,DK/SHF"
D_ALU.LEFT      "SHF/LEFT,DK/SHF"
D_ALU.LEFT2     "SHF/ALU.DT,DT/LONG,DK/SHF"
D_ALU.LEFT3     "SHF/LEFT3,DK/SHF"
D_ALU.RIGHT     "SHF/RIGHT,DK/SHF"
D_ALU.RIGHT2    "SHF/RIGHT2,DK/SHF"
D_ALU(FRAC)     "SHF/ALU,DK/SHF.FL"
D_BLANK         "D_K[.20]"
D[]_CACHE       "VAK/NOP,MCT/READ.V.RCHK,DT/@1,DK/NOP"
D_CACHE[]       "VAK/NOP,MCT/READ.V.RCHK,MSC/@1,DK/NOP"
D[]_CACHE.IBCHK "VAK/NOP,MCT/READ.V.IBCHK,DT/@1,DK/NOP"
D_CACHE.INST.DEP        "VAK/NOP,MCT/READ.V.IBCHK,DT/INST.DEP,DK/NOP"
D_CACHE.LK[]    "VAK/NOP,MCT/LOCKREAD.V.WCHK,MSC/@1,DK/NOP"
D[]_CACHE.LK    "VAK/NOP,MCT/LOCKREAD.V.WCHK,DT/@1,DK/NOP"
D[]_CACHE.NOCHK "VAK/NOP,MCT/READ.V.NOCHK,DT/@1,DK/NOP"
D[]_CACHE.P     "VAK/NOP,MCT/READ.P,DT/@1,DK/NOP"
D[]_CACHE.WCHK  "VAK/NOP,MCT/READ.V.WCHK,DT/@1,DK/NOP"
D_CACHE.WCHK[]  "VAK/NOP,MCT/READ.V.WCHK,MSC/@1,DK/NOP"
```

```
D_DAL.NORM      'DK/DAL.SV''
D_DAL.SC        'DK/DAL.SC''
D_D.OXT[]       'RAMX/D,AMX/RAMX.OXT,DT/@1,ALU/A,SHF/ALU,DK/SHF''
D_D.OXT[].ANDNOT.K[]     'RAMX/D,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/ANDNOT,SHF/ALU,DK/SHF''
D_D.OXT[]+K[]   'RAMX/D,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/A+B,SHF/ALU,DK/SHF''
D_D.OXT[].OR.Q  'RAMX/D,AMX/RAMX.OXT,DT/@1,RBMX/Q,BMX/RBMX,ALU/OR,SHF/ALU,DK/SHF''
D_D.OXT[]+Q     ''ALU/A+B,AMX/RAMX.OXT,DT/@1,BMX/RBMX,RBMX/Q,D_ALU''
D_D.OXT[]+Q+1   'RAMX/D,AMX/RAMX.OXT,DT/@1,BMX/RBMX,ALU/A+B+1,D_ALU''
D_D.OXT[].XOR.Q 'DK/SHF,ALU/XOR,SHF/ALU,AMX/RAMX.OXT,RAMX/D,DT/@1,RBMX/Q,BMX/RBMX''
D_D.OXT[].XOR.RC[]       'RAMX/D,AMX/RAMX.OXT,DT/@1,SPO.R/LOAD.LC,SPO.RC/@2,BMX/LC,ALU/XOR,SHF/ALU,DK/SHF''
D_D.AND.K[]     'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,DK/SHF''
D_D.AND.K[].LEFT2        'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU.DT,DT/LONG,DK/SHF''
D_D.AND.K[].RIGHT        'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/RIGHT,DK/SHF''
D_D.AND.LC      'RAMX/D,AMX/RAMX,BMX/LC,ALU/AND,SHF/ALU,DK/SHF''
D_D.AND.MASK    'RAMX/D,AMX/RAMX,BMX/MASK,ALU/AND,SHF/ALU,DK/SHF''
D_D.AND.Q       'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/AND,SHF/ALU,DK/SHF''
D_D.AND.RC[]    'RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/AND,SHF/ALU,DK/SHF''
D_D.ANDNOT.K[]  'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/ANDNOT,SHF/ALU,DK/SHF''
D_D.ANDNOT.LC   'RAMX/D,AMX/RAMX,BMX/LC,ALU/ANDNOT,SHF/ALU,DK/SHF''
D_D.ANDNOT.PSWZ 'DK/SHF,ALU/ANDNOT,AMX/RAMX,RAMX/D,BMX/KMX,KMX/.4,SHF/ALU''
D_D.ANDNOT.Q    'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/ANDNOT,SHF/ALU,DK/SHF''
D_D.ANDNOT.RC[] 'RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/ANDNOT,SHF/ALU,DK/SHF''
D_D(FRAC)       'RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,DK/SHF.FL''
D_D[]K[]        'RAMX/D,AMX/RAMX,KMX/@2,BMX/KMX,ALU/@1,SHF/ALU,DK/SHF''
D_D+K[]         'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,SHF/ALU,DK/SHF''
D_D-K[]         'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,DK/SHF''
D_D+K[]+1       'RAMX/D,AMX/RAMY,KMX/@1,BMX/KMX,ALU/A+B+1,SHF/ALU,DK/SHF''
D_D+LB          'RAMX/D,AMX/RAMX,BMX/LB,ALU/A+B,SHF/ALU,DK/SHF''
D_D+LC          'RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B,SHF/ALU,DK/SHF''
D_D-LC          'RAMX/D,AMX/RAMX,BMX/LC,ALU/A-B,SHF/ALU,DK/SHF''
D_D+LC+PSL.C    'RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B+PSL.C,SHF/ALU,DK/SHF''
D_D.LEFT        'DK/LEFT''
D_D.LEFT2       'DK/LEFT2''
D_D[]MASK       'RAMX/D,AMX/RAMX,BMX/MASK,ALU/@1,SHF'ALU,DK/SHF''
D_D.OR.ASCII    'D_D.OR.K[.30]''
D_D.OR.K[]      'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR,SHF/ALU,DK/SHF''
D_D.ORNOT.MASK  'RAMX/D,AMX/RAMX,BMX/MASK,ALU/ORNOT,SHF/ALU,DK/SHF''
D_D.OR.PSWC     'DK/SHF,ALU/OR,AMX/RAMX,RAMX/D,BMX/KMX,KMX/.1,SHF/ALU''
D_D.OR.PSWV     'DK/SHF,ALU/OR,AMX/RAMX,RAMX/D,BMX/KMX,KMX/.2,SHF/ALU''
D_D.OR.Q        'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/OR,SHF/ALU,DK/SHF''
D_D.OR.RC[]     'RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/OR,SHF/ALU,DK/SHF''
D_D[]Q          'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/@1,SHF/ALU,DK/SHF''
D_D+Q           'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU,DK/SHF''
D_D-Q           'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU,DK/SHF''
D_D+Q+1         'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B+1,SHF/ALU,DK/SHF''
D_D-Q-1         'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A-B-1,SHF/ALU,DK/SHF''
D_D.RIGHT       'DK/RIGHT''
D_D.RIGHT2      'DK/RIGHT2''
D_D.RIGHT(B)    'RBMX/D,BMX/RBMX,ALU/B,SHF/RIGHT,DK/SHF''
D_D.SWAP        'DK/BYTE.SWAP''
D_D.SXT[]       'RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A,SHF/ALU,DK/SHF''
D_D.SXT[].RIGHT 'RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A,SHF/RIGHT,DK/SHF''
D_D.XOR.K[]     'RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/XOR,SHF/ALU,DK/SHF''
D_D.XOR.LC      'RAMX/D,AMX/RAMX,BMX/LC,ALU/XOR,SHF/ALU,DK/SHF''
D_D.XOR.Q       'RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/XOR,SHF/ALU,DK/SHF''
```

```
D_INT.SUM       ''MCT/READ.INT.SUM,DK/NOP''
D_K[]           ''KMX/@1,BMX/KMX,ALU/B,SHF/ALU,DK/SHF''
D_K[].RIGHT     ''KMX/@1,BMX/KMX,ALU/B,SHF/RIGHT,DK/SHF''
D_K[].RIGHT2    ''KMX/@1,BMX/KMX,ALU/B,SHF/RIGHT2,DK/SHF''
D_LA            ''AMX/LA,ALU/A,SHF/ALU,DK/SHF''
D_LA.AND.K[]    ''AMX/LA,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,DK/SHF''
D_LA+D+PSL.C    ''AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B+PSL.C,SHF/ALU,DK/SHF''
D_LA-D          ''DK/SHF,ALU/A-B,AMX/LA,BMX/RBMX,RBMX/D,SHF/ALU''
D_LA(FRAC)      ''AMX/LA,ALU/A,SHF/ALU,DK/SHF.FL''
D_LA-K[]        ''AMX/LA,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,DK/SHF '
D_LA.RIGHT      ''AMX/LA,ALU/A,SHF/RIGHT,DK/SHF''
D_LB            ''BMX/LB,ALU/B,SHF/ALU,DK/SHF''
D_LB.PC         ''BMX/PC.OR.LB,ALU/B,SHF/ALU,DK/SHF''
D_LC            ''BMX/LC,ALU/B,SHF/ALU,DK/SHF''
D_LC(FRAC)      ''BMX/LC,ALU/B,SHF/ALU,DK/SHF.FL''
D_NOT.D         ''RAMX/D,AMX/RAMX,ALU/NOTA,SHF/ALU,DK/SHF''
D_NOT.K[]       ''KMX/@1,BMX/KMX,AMX/RAMX.OXT,DT/LONG,ALU/ORNOT,SHF/ALU,DK/SHF''
D_NOT.MASK      ''BMX/MASK,AMX/RAMX.OXT,DT/LONG,ALU/ORNOT,SHF/ALU,DK/SHF''
D_NOT.Q         ''RAMX/Q,AMX/RAMX,ALU/NOTA,SHF/ALU,DK/SHF''
D_NOT.R[]       ''LA_RA[@1],AMX/LA,ALU/NOTA,D_ALU''
D_PACK.FP       ''BMX/PACKED.FL,ALU/B,SHF/ALU,DK/SHF''
D_PACK.FP.LEFT  ''BMX/PACKED.FL,ALU/B,SHF/LEFT,DK/SHF''
D_PC            ''BMX/PC,ALU/B,SHF/ALU,DK/SHF''
D_PC.LEFT       ''BMX/PC,ALU/B,SHF/LEFT,DK/SHF''
```

```
D_Q             "DK/Q"
D_Q.OXT[]       "RAMX/Q,AMX/RAMX.OXT,DT/@1,ALU/A,SHF/ALU,DK/SHF"
D_Q.AND.K[]     "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,DK/SHF"
D_Q.AND.LC      "RAMX/Q,AMX/RAMX,BMX/LC,ALU/AND,SHF/ALU,DK/SHF"
D_Q.AND.MASK    "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/AND,SHF/ALU,DK/SHF"
D_Q.ANDNOT.D    "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/ANDNOT,SHF/ALU,DK/SHF"
D_Q.ANDNOT.K[]  "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/ANDNOT,SHF/ALU,DK/SHF"
D_Q.ANDNOT.MASK "PAMX/Q,AMX/RAMX,BMX/MASK,ALU/ANDNOT,SHF/ALU,DK/SHF"
D_Q.ANDNOT.PSWC "DK/SHF,ALU/ANDNOT,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/.1,SHF/ALU"
D_Q.ANDNOT.PSWN "DK/SHF,ALU/ANDNOT,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/.8,SHF/ALU"
D_Q.ANDNOT.PSWZ "DK/SHF,ALU/ANDNOT,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/.4,SHF/ALU"
D_Q.AND.RC[]    "RAMX/Q,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/AND,SHF/ALU,DK/SHF"
D&Q_D+Q         "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU,DK/SHF,QK/SHF"
D_Q+D           "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A+B,SHF/ALU,DK/SHF"
D_Q-D           "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,DK/SHF"
D_Q-D-1         "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B-1,SHF/ALU,DK/SHF"
D_Q[]D          "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/@1,SHF/ALU,DK/SHF"
D_Q(FRAC)       "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,DK/SHF.FL"
D_Q+K[]         "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,SHF/ALU,DK/SHF"
D_Q-K[]         "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,DK/SHF"
D_Q-K[]-1       "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B-1,SHF/ALU,DK/SHF"
D_Q+LB          "RAMX/Q,AMX/RAMX,BMX/LB,ALU/A+B,SHF/ALU,DK/SHF"
D_Q[]MASK       "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/@1,SHF/ALU,DK/SHF"
D_Q.LEFT        "RAMX/Q,AMX/RAMX,ALU/A,SHF/LEFT,DK/SHF"
D_Q.OR.K[]      "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR,SHF/ALU,DK/SHF"
D_Q.ORNOT.MASK  "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/ORNOT,SHF/ALU,DK/SHF"
D_Q.OR.PSWC     "DK/SHF,ALU/OR,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/.1,SHF/ALU"
D_Q.OR.RC[]     "RAMX/Q,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/OR,SHF/ALU,DK/SHF"
D_Q+PC          "RAMX/Q,AMX/RAMX,BMX/PC,ALU/A+B,SHF/ALU,DK/SHF"
D_Q-PCSV        "RAMX/Q,AMX/RAMX,BMX/0,MSC/READ.RLOG,ALU/A-B,SHF/ALU,DK/SHF"
D_Q.RIGHT       "RAMX/Q,AMX/RAMX,ALU/A,SHF/RIGHT,DK/SHF"
D_Q.RIGHT2      "RAMX/Q,AMX/RAMX,ALU/A,SHF/RIGHT2,DK/SHF"
D_Q.SXT[]       "RAMX/Q,AMX/RAMX.SXT,DT/@1,ALU/A,SHF/ALU,DK/SHF"
D_Q.XOR.RC[]    "RAMX/Q,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/XOR,SHF/ALU,DK/SHF"
```

```
D_R[]            "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SHF/ALU,DK/SHF"
D_R[].AND.K[]    "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/AND,SHF/ALU,DK/SHF"
D_R[].ORNOT.K[]  "LAB_R[@1],AMX/LA,BMX/KMX,KMX/@2,ALU/ORNOT,D_ALU"
D_RC[]           "SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,SHF/ALU,DK/SHF"
D&RC[]_PC        "BMX/PC,ALU/B,SHF/ALU,DK/SHF,SPO.R/WRITE.RC,SPO.RC/@1"
D_RC(SC)         "SPO/LOAD.LC.SC,BMX/LC,ALU/B,SHF/ALU,DK/SHF"
D_R[](FRAC)      "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SHF/ALU,DK/SHF.FL"
D_RLOG           "BMX/0,MSC/READ.RLOG,ALU/B,SHF/ALU,DK/SHF"
D_RLOG.RIGHT     "BMX/0,MSC/READ.RLOG,ALU/B,SHF/RIGHT,DK/SHF"
D_R(PRN+1)       "SPO.AC/LOAD.LAB,SPO.ACN/PRN+1,AMX/LA,ALU/A,SHF/ALU,DK/SHF"
D_R(SC)          "SPO.AC/LOAD.LAB,SPO.ACN/SC,AMX/LA,ALU/A,SHF/ALU,DK/SHF"
D_R(SP1+1)       "SPO.AC/LOAD.LAB,SPO.ACN/SP1+1,AMX/LA,ALU/A,SHF/ALU,DK/SHF"
D&VA_ALU         "VAK/LOAD,SHF/ALU,DK/SHF"
D&VA_D-K[]       "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,VAK/LOAD,SHF/ALU,DK/SHF"
D&VA_D+LC        "RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B,VAK/LOAD,SHF/ALU,DK/SHF"
D&VA_D+Q         "D_D+Q,VAK/LOAD"
D&VA_LA          "AMX/LA,ALU/A,VAK/LOAD,SHF/ALU,DK/SHF"
D&VA_LB          "BMX/LB,ALU/B,VAK/LOAD,SHF/ALU,DK/SHF"
D&VA_Q           "RAMX/Q,AMX/RAMX,ALU/A,VAK/LOAD,DK/Q"
D&VA_Q+LB.PC     "RAMX/Q,AMX/RAMX,BMX/PC.OR.LB,ALU/A+B,VAK/LOAD,SHF/ALU,DK/SHF"
```

```
EALU_D(EXP)        "RAMX/D,AMX/RAMX,EBMX/AMX.EXP,EALU/B"
EALU_FE            "EBMX/FE,EALU/B"
EALU_K[]           "KMX/@1,EBMX/KMX,EALU/B"
EALU_R[](EXP)      "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,EBMX/AMX.EXP,EALU/B"
EALU_SC            "EALU/A"
EALU_SC.ANDNOT.K[]          "KMX/@1,EBMX/KMX,EALU/ANDNOT"
EALU_SC+FE         "EBMX/FE,EALU/A+B"
EALU_SC-FE         "EBMX/FE,EALU/A-B"
EALU_SC+K[]        "KMX/@1,EBMX/KMX,EALU/A+B"
EALU_SC-K[]        "KMX/@1,EBMX/KMX,EALU/A-B"
EALU_STATE         "EALU/A,MSC/LOAD.STATE"

FE_O(A)            "AMX/RAMX.OXT,DT/LONG,EBMX/AMX.EXP,EALU/B,FEK/LOAD"
FE_D(EXP)          "RAMX/D,AMX/RAMX,EBMX/AMX.EXP,EALU/B,FEK/LOAD"
FE_EALU            "FEK/LOAD"
FE_K[]             "KMX/@1,EBMX/KMX,EALU/B,FEK/LOAD"
FE_LA(EXP)         "AMX/LA,EBMX/AMX.EXP,EALU/B,FEK/LOAD"
FE_NABS(SC-LA(EXP)) "AMX/LA,EBMX/AMX.EXP,EALU/NABS.A-B,FEK/LOAD"
FE_Q(EXP)          "RAMX/Q,AMX/RAMX,EBMX/AMX.EXP,EALU/B,FEK/LOAD"
FE_R[](EXP)        "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,EBMX/AMX.EXP,EALU/B,FEK/LOAD"
FE_SC              "EALU/A,FEK/LOAD"
FE_SC.ANDNOT.FE             "EBMX/FE,EALU/ANDNOT,FEK/LOAD"
FE_SC.ANDNOT.K[]            "KMX/@1,EBMX/KMX,EALU/ANDNOT,FEK/LOAD"
FE_SC+1            "EALU/A+1,FEK/LOAD"
FE_SC+FE           "EBMX/FE,EALU/A+B,FEK/LOAD"
FE_SC-FE           "EBMX/FE,EALU/A-B,FEK/LOAD"
FE&SC_K[]          "KMX/@1,EBMX/KMX,EALU/B,FEK/LOAD,SMX/EALU,SCK/LOAD"
FE_SC+K[]          "KMX/@1,EBMX/KMX,EALU/A+B,FEK/LOAD"
FE_SC-K[]          "KMX/@1,EBMX/KMX,EALU/A-B,FEK/LOAD"
FE_SC+LA(EXP)      "AMX/LA,EBMX/AMX.EXP,EALU/A+B,FEK/LOAD"
FE_SC-LA(EXP)      "AMX/LA,EBMX/AMX.EXP,EALU/A-B,FEK/LOAD"
FE_SC.OR.K[]       "EALU/OR,EBMX/KMX,KMX/@1,FEK/LOAD"
FE_SC-SHF.VAL      "EBMX/SHF.VAL,EALU/A-B,FEK/LOAD"
FE_SHF.VAL         "EBMX/SHF.VAL,EALU/B,FEK/LOAD"
```

```
ID[]_D          "CID/WRITE.KMX,ID.ADDR/@1"
ID_D&NO.SYNC    "CID/WRITE.KMX,ADS/IBA,KMX/SP1.CON"
ID_D.SYNC       "CID/WRITE.KMX,ADS/IBA,KMX/SP1.CON,ACF/SYNC"
ID(SC)_D        "CID/WRITE.SC"

K[]             "KMX/@1"

LA_RA[]         "SPO.AC/LOAD.LA,SPO.RAB/@1"
LA_R(DST)&LB_R(SRC)     "SPO.AC/LOAD.LAB,SPO.ACN11/DST.SRC"
LA_R(SP2)&LB_R(SP1)     "SPO.AC/LOAD.LAB,SPO.ACN/SP2.SP1"
LAB_R1&RC[]_0           "ALU_0(A),LAB_R1&RC[@1]_ALU"
LAB_R1&RC[]_ALU "SPO.R/LOAD.LAB1.WRITE.RC,SPO.RC/@1,SHF/ALU"
LAB_R1&RC[]_ALU.RIGHT2  "SPO.R/LOAD.LAB1.WRITE.RC,SPO.RC/@1,SHF/RIGHT2"
LAB_R1&RC[]_D.OXT[]+K[] "ALU_D.OXT[@2]+K[@3],LAB_R1&RC[@1]_ALU"
LAB_R1&RC[]_D+LC        "ALU_D+LC,LAB_R1&RC[@1]_ALU"
LAB_R1&RC[]_Q-K[]       "ALU_Q-K[@2],LAB_R1&RC[@1]_ALU"
LAB_R1&RC[]_O-D "SPO.R/LOAD.LAB1.WRITE.RC,SPO.RC/@1,ALU/A-B,AMX/RAMX.OXT,DT/LONG,BMX/RBMX,RBMX/D,SHF/ALU"
LAB_R1&RC[]_O+LC+1      "ALU/A+B+1,AMX/RAMX.OXT,DT/LONG,BMX/LC,SPO.R/LOAD.LAB1.WRITE.RC,SPO.RC/@1,SHF/ALU"
LAB_R[]         "SPO.R/LOAD.LAB,SPO.RAB/@1"
LAB_R(DST)      "SPO.AC/LOAD.LAB,SPO.ACN11/DST.DST"
LAB_R(SC)       "SPO.AC/LOAD.LAB,SPO.ACN/SC"
LAB_R(SP1)      "SPO.AC/LOAD.LAB,SPO.ACN/SP1.SP1"
LC_RC[]         "SPO.R/LOAD.LC,SPO.RC/@1"
LC_RC[]&R1_D            "ALU_D,LC_RC[@1]&R1_ALU"
LC_RC[]&R1_LA-K[]       "ALU_LA-K[@2],LC_RC[@1]&R1_ALU"
LC_RC(SC)       "SPO/LOAD.LC.SC"
LC_RC[]&R1_ALU  "SPO.R/LOAD.LC.WRITE.RAB1,SPO.RC/@1,SHF/ALU"
LC_RC[]&R1_(LA+LB).LEFT "AMX/LA,BMX/LB,ALU/A+B,SHF/LEFT,SPO.R/LOAD.LC.WRITE.RAB1,SPO.RC/@1"
LC_RC[]&R1_(LA-LB).LEFT "AMX/LA,BMX/LB,ALU/A-B,SHF/LEFT,SPO.R/LOAD.LC.WRITE.RAB1,SPO.RC/@1"
LC_RC[]&R1_LA+K[]       "SPO.R/LOAD.LC.WRITE.RAB1,SPO.RC/@1,SHF/ALU,ALU/A+B,AMX/LA,BMX/KMX,KMX/@2"
LC_RC[]&R1_LB   "ALU_LB,LC_RC[@1]&R1_ALU"
LC_RC[]&R1_Q    "SPO.R/LOAD.LC.WRITE.RAB1,SPO.RC/@1,SHF/ALU,ALU/A,AMX/RAMX,RAMX/Q"
```

```
PC_PC+1           ''PCK/PC+1''
PC_PC+2           ''PCK/PC+2''
PC_PC+4           ''PCK/PC+4''
PC_PC+N           ''PCK/PC+N''
PC_Q+PC           ''ALU/A+B,VAK/LOAD,PCK/PC_VA,BMX/PC,AMX/RAMX,RAMX/Q''
PC_VA             ''PCK/PC_VA''
PC&VA_ALU         ''VAK/LOAD,PCK/PC_VA''
PC&VA_D           ''RAMX/D,AMX/RAMX,ALU/A,VAK/LOAD,PCK/PC_VA''
PC&VA_D.OXT[]     ''RAMX/D,AMX/RAMX.OXT,DT/@1,ALU/A,VAK/LOAD,PCK/PC_VA''
PC&VA_D.OXT[]+PC          ''RAMX/D,AMX/RAMX.OXT,DT/@1,BMX/PC,ALU/A+B,VAK/LOAD,PCK/PC_VA''
PC&VA_D.SXT[]+PC  ''RAMX/D,AMX/RAMX.SXT,DT/@1,BMX/PC,ALU/A+B,VAK/LOAD,PCK/PC_VA''
PC&VA_D+K[]       ''RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,VAK/LOAD,PCK/PC_VA''
PC&VA_D-K[]       ''RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,VAK/LOAD,PCK/PC_VA''
PC&VA_D-PC        ''RAMX/D,AMX/RAMX,BMX/PC,ALU/A-B,VAK/LOAD,PCK/PC_VA''
PC&VA_K[]         ''KMX/@1,BMX/KMX,ALU/B,VAK/LOAD,PCK/PC_VA''
PC&VA_PC          ''BMX/PC,ALU/B,VAK/LOAD,PCK/PC_VA''
PC&VA_Q           ''RAMX/Q,AMX/RAMX,ALU/A,VAK/LOAD,PCK/PC_VA''
PC&VA_Q-D         ''RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B,VAK/LOAD,PCK/PC_VA''
PC&VA_Q-K[]       ''RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,VAK/LOAD,PCK/PC_VA''
PC&VA_Q+PC        ''RAMX/Q,AMX/RAMX,BMX/PC,ALU/A+B,VAK/LOAD,PCK/PC_VA''
PC&VA_Q.SXT[]+PC          ''RAMX/Q,AMX/RAMX.SXT,DT/@1,BMX/PC,ALU/A+B,VAK/LOAD,PCK/PC_VA''
PC&VA_R[].ANDNOT.K[] ''SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/ANDNOT,VAK/LOAD,PCK/PC_VA''
PC&VA_RC[]        ''SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,VAK/LOAD,PCK/PC_VA''
PC_VIBA           ''PCK/PC_IBA''
```

```
Q_0             "QK/CLR"
Q_0-D           "AMX/RAMX.OXT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,QK/SHF"
Q_0-K[]         "AMX/RAMX.OXT,DT/LONG,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,QK/SHF"
Q_0-LC          "AMX/RAMX.OXT,DT/LONG,BMX/LC,ALU/A-B,SHF/ALU,QK/SHF"
Q_0+MASK+1      "AMX/RAMX.OXT,DT/LONG,BMX/MASK,ALU/A+B+1,SHF/ALU,QK/SHF"
Q_0+PC.RLOG     "AMX/RAMX.OXT,DT/LONG,BMX/PC,ALU/A+B.RLOG,SHF/ALU,QK/SHF"
Q_0-Q           "AMX/RAMX.OXT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU,QK/SHF"
Q_ACCEL&SYNC    "QK/ACCEL,ACF/SYNC"
Q_ALU           "SHF/ALU,QK/SHF"
Q_ALU.LEFT      "SHF/LEFT,QK/SHF"
Q_ALU.LEFT2     "SHF/ALU.DT,DT/LONG,QK/SHF"
Q_ALU.RIGHT     "SHF/RIGHT,QK/SHF"
Q_ALU.RIGHT2    "SHF/RIGHT2,QK/SHF"
Q_ALU(FRAC)     "SHF/ALU,QK/SHF.FL"
Q_D             "QK/D"
Q_D(FRAC)(B)    "RBMX/D,BMX/RBMX,ALU/B,SHF/ALU,QK/SHF.FL"
Q_D.OXT[]       "RAMX/D,AMX/RAMX.OXT,DT/@1,ALU/A,SHF/ALU,QK/SHF"
Q_D.OXT[]+K[].LEFT "RAMX/D,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/A+B,SHF/LEFT,QK/SHF"
Q_D.AND.K[]     "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,QK/SHF"
Q_D.AND.K[].RIGHT       "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/RIGHT,QK/SHF"
Q_D.AND.K[].RIGHT2      "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/RIGHT2,QK/SHF"
Q_D.ANDNOT.RC[] "RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/ANDNOT,SHF/ALU,QK/SHF"
Q_D.AND.RC[]    "RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/AND,SHF/ALU,QK/SHF"
Q_DEC.CON       "QK/DEC.CON"
Q_D+K[]         "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,SHF/ALU,QK/SHF"
Q_D+K[].LEFT    "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,SHF/LEFT,QK/SHF"
Q_D-K[]         "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,QK/SHF"
Q_D+LC          "RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B,SHF/ALU,QK/SHF"
Q_D-LC          "RAMX/D,AMX/RAMX,BMX/LC,ALU/A-B,SHF/ALU,QK/SHF"
Q_D.LEFT3       "RAMX/D,AMX/RAMX,ALU/A,SHF/LEFT3,QK/SHF"
Q_D.OR.K[]      "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR,SHF/ALU,QK/SHF"
Q_D.OR.RC[]     "RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/OR,SHF/ALU,QK/SHF"
Q_D-Q           "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU,QK/SHF"
Q_D.RIGHT       "RAMX/D,AMX/RAMX,ALU/A,SHF/RIGHT,QK/SHF"
Q_D.RIGHT2      "RAMX/D,AMX/RAMX,ALU/A,SHF/RIGHT2,QK/SHF"
Q_D.SXT[]       "RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A,SHF/ALU,QK/SHF"
Q_D.XOR.Q       "QK/SHF,ALU/XOR,AMX/RAMX,RAMX/D,BMX/RBMX,RBMX/Q,SHF/ALU"
```

```
Q_IB.BDEST        "IBC/BDEST,QK/ID,MCT/ALLOW.IB.READ"
Q_IB.DATA         "QK/ID,MCT/ALLOW.IB.READ"
Q_ID[]            "CID/READ.KMX,ID.ADDR/@1,QK/ID"
Q_ID(SC)          "CID/READ.SC,QK/ID"
Q_K[]             "KMX/@1,BMX/KMX,ALU/B,SHF/ALU,QK/SHF"
Q_K[].CTX         "KMX/@1,BMX/KMX,ALU/B,SHF/ALU.DT,DT/INST.DEP,QK/SHF"
Q_K[].RIGHT       "KMX/@1,BMX/KMX,ALU/B,SHF/RIGHT,QK/SHF"
Q_K[].RIGHT2      "KMX/@1,BMX/KMX,ALU/B,SHF/RIGHT2,QK/SHF"
Q_LA              "AMX/LA,ALU/A,SHF/ALU,QK/SHF"
Q_LA.AND.K[]      "AMX/LA,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,QK/SHF '
Q_LA.ANDNOT.RC[]          "AMX/LA,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/ANDNOT,SHF/ALU,QK/SHF"
Q_LA+K[]          "AMX/LA,KMX/@1,BMX/KMX,ALU/A+B,SHF/ALU,QK/SHF"
Q_LA-K[]          "AMX/LA,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,QK/SHF"
Q_LA+Q            "AMX/LA,RBMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU,QK/SHF"
Q_LB              "BMX/LB,ALU/B,SHF/ALU,QK/SHF"
Q_LC              "BMX/LC,ALU/B,SHF/ALU,QK/SHF"
Q_NOT.Q           "RAMX/Q,AMX/RAMX,ALU/NOTA,SHF/ALU,QK/SHF"
Q_NOT.R[]         "LA_RA[@1],AMX/LA,ALU/NOTA,Q_ALU"
Q_PACK.FP         "BMX/PACKED.FL,ALU/B,SHF/ALU,QK/SHF"
Q_PC              "BMX/PC,ALU/B,SHF/ALU,QK/SHF"
```

```
Q_Q.OXT[]-K[]      "RAMX/Q,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/A-B,SHF/ALU,QK/SHF"
Q_Q.OXT[].LEFT     "RAMX/Q,AMX/RAMX.OXT,DT/@1,ALU/A,SHF/LEFT,QK/SHF"
Q_Q.OXT[].OR.D     "RAMX/Q,AMX/RAMX.OXT,DT/@1,RBMX/D,BMX/RBMX,ALU/OR,SHF/ALU,QK/SHF"
Q_Q.AND.K[]        "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,QK/SHF"
Q_Q.AND.K[].RIGHT          "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SHF/RIGHT,QK/SHF"
Q_Q.ANDNOT.D       "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/ANDNOT,SHF/ALU,QK/SHF"
Q_Q.ANDNOT.K[]     "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/ANDNOT,SHF/ALU,QK/SHF"
Q_Q.ANDNOT.RC[]    "RAMX/Q,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/ANDNOT,SHF/ALU,QK/SHF"
Q_Q.AND.RC[]       "RAMX/Q,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/AND,SHF/ALU,QK/SHF"
Q_Q-D              "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,QK/SHF"
Q_Q+D              "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A+B,SHF/ALU,QK/SHF"
Q_Q-D-1            "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B-1,SHF/ALU,QK/SHF"
Q_Q(FRAC)          "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,QK/SHF.FL"
Q_Q(FRAC)(B)       "RBMX/Q,BMX/RBMX,ALU/B,SHF/ALU,QK/SHF.FL"
Q_Q+K[]            "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,SHF/ALU,QK/SHF"
Q_Q-K[]            "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,SHF/ALU,QK/SHF"
Q_Q-K[]-1          "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B-1,SHF/ALU,QK/SHF"
Q_Q+LC             "RAMX/Q,AMX/RAMX,BMX/LC,ALU/A+B,SHF/ALU,QK/SHF"
Q_Q-LC             "RAMX/Q,AMX/RAMX,BMX/LC,ALU/A-B,SHF/ALU,QK/SHF"
Q_Q-LC-1           "RAMX/Q,AMX/RAMX,BMX/LC,ALU/A-B-1,SHF/ALU,QK/SHF"
Q_Q.LEFT           "QK/LEFT"
Q_Q-MASK-1         "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/A-B-1,SHF/ALU,QK/SHF"
Q_Q.OR.K[]         "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR,SHF/ALU,QK/SHF"
Q_Q.ORNOT.MASK     "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/ORNOT,SHF/ALU,QK/SHF"
Q_Q+PC             "RAMX/Q,AMX/RAMX,BMX/PC,ALU/A+B,SHF/ALU,QK/SHF"
Q_Q.RIGHT          "QK/RIGHT"
Q_Q.RIGHT2         "QK/RIGHT2"
Q_Q.SXT[]          "RAMX/Q,AMX/RAMX.SXT,DT/@1,ALU/A,SHF/ALU,QK/SHF"
Q_R[]              "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SHF/ALU,QK/SHF"
Q_R[].AND.K[]      "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/AND,SHF/ALU,QK/SHF"
Q_R[].AND.K[].RIGHT        "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/AND,BMX/KMX,KMX/@2,SHF/RIGHT,QK/SHF"
Q_R[].ANDNOT.K[]           "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/ANDNOT,SHF/ALU,QK/SHF"
Q_RC[]             "SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,SHF/ALU,QK/SHF"
Q_RC[](FRAC)       "SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,SHF/ALU,QK/SHF.FL"
Q_R[](FRAC)        "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SHF/ALU,QK/SHF.FL"
Q_R(PRN).ANDNOT.Q          "SPO.AC/LOAD.LAB,SPO.ACN/PRN,AMX/LA,RBMX/Q,BMX/RBMX,ALU/ANDNOT,SHF/ALU,QK/SHF"
Q_R(PRN+1)         "SPO.AC/LOAD.LAB,SPO.ACN/PRN+1,AMX/LA,ALU/A,SHF/ALU,QK/SHF"
Q_R(PRN+1).AND.Q           "SPO.AC/LOAD.LAB,SPO.ACN/PRN+1,AMX/LA,RBMX/Q,BMX/RBMX,ALU/AND,SHF/ALU,QK/SHF"
Q_R(SRC!1).AND.K[]         "SPO.AC/LOAD.LAB,SPO.ACN11/SRC.OR.1,AMX/LA,KMX/@1,BMX/KMX,ALU/AND,SHF/ALU,QK/SHF"
Q_SC               "ALU/B,BMX/KMX,KMX/SC,SHF/ALU,QK/SHF"
Q&VA_ALU           "VAK/LOAD,SHF/ALU,QK/SHF"
Q&VA_D             "RAMX/D,AMX/RAMX,ALU/A,VAK/LOAD,SHF/ALU,QK/SHF"
Q&VA_D+LC          "RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B,VAK/LOAD,SHF/ALU,QK/SHF"
Q&VA_LA            "AMX/LA,ALU/A,VAK/LOAD,SHF/ALU,QK/SHF"
Q&VA_Q+LB.PC       "RAMX/Q,AMX/RAMX,BMX/PC.OR.LB,ALU/A+B,VAK/LOAD,SHF/ALU,QK/SHF"
```

```
R[]_0           "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/RAMX.OXT,DT/LONG,ALU/A,SHF/ALU"
R[]_0-D         "AMX/RAMX.OXT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_0-K[]       "AMX/RAMX.OXT,DT/LONG,KMX/@2,BMX/KMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_0-LB        "AMX/RAMX.OXT,DT/LONG,BMX/LB,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_0+LB+1      "AMX/RAMX.OXT,DT/LONG,BMX/LB,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_0-Q         "AMX/RAMX.OXT,DT/LONG,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_0-1         "AMX/RAMX.OXT,DT/LONG,BMX/KMX,KMX/.1,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_ALU         "SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_ALU.LEFT    "SPO.R/WRITE.RAB,SPO.RAB/@1,SHF/LEFT"
R[]_ALU.RIGHT   "SHF/RIGHT,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_D           "SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/D,AMX/RAMX,ALU/A,SHF/ALU"
R[]_D.AND.K[]   "SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/AND,AMX/RAMX,RAMX/D,BMX/KMX,KMX/@2,SHF/ALU"
R[]_D+K[]       "SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/D,AMX/RAMX,KMX/@2,BMX/KMX,ALU/A+B,SHF/ALU"
R[]_D-K[]       "SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/D,AMX/RAMX,KMX/@2,BMX/KMX,ALU/A-B,SHF/ALU"
R6_D+K[].RLOG   "SPO.R/WRITE.RAB,SPO.RAB/R6,RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B.RLOG,SHF/ALU"
R[]_D-LC-1      "ALU_D-LC-1,R[@1]_ALU"
R[]_D.OR.LC     "SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/OR,AMX/RAMX,RAMX/D,BMX/LC,SHF/ALU"
R[]_D.OR.PACK.FP        "SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/OR,AMX/RAMX,RAMX/D,BMX/PACKED.FL,SHF/ALU"
R[]_D.OR.Q      "SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/OR,SHF/ALU"
R[]_D+Q         "SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU"
R[]_D-Q         "SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU"
R[]_D+Q+1       "SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B+1,SHF/ALU"
R[]_K[]         "BMX/KMX,KMX/@2,ALU/B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA          "SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/LA,ALU/A,SHF/ALU"
R[]_LA.AND.K[]  "AMX/LA,BMX/KMX,KMX/@2,ALU/AND,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+D        "AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+D+1      "AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA-D        "AMX/LA,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+K[]      "AMX/LA,BMX/KMX,KMX/@2,ALU/A+B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+K[]+1    "AMX/LA,BMX/KMX,KMX/@2,ALU/A+B+1,R[@1]_ALU"
R[]_LA-K[]      "AMX/LA,BMX/KMX,KMX/@2,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+K[].RLOG "AMX/LA,BMX/KMX,KMX/@2,ALU/A+B.RLOG,DT/LONG,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA-K[].RLOG "AMX/LA,BMX/KMX,KMX/@2,ALU/A-B.RLOG,DT/LONG,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R6_LA+K[].RLOG  "AMX/LA,BMX/KMX,KMX/@1,ALU/A+B.RLOG,DT/WORD,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/R6"
R6_LA-K[].RLOG  "AMX/LA,BMX/KMX,KMX/@1,ALU/A-B.RLOG,DT/WORD,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/R6"
R[]_LA+LC       "AMX/LA,BMX/LC,ALU/A+B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA+MASK+1   "AMX/LA,BMX/MASK,ALU/A+B+1,R[@1]_ALU"
R[]_LA-MASK-1   "ALU/A-B-1,AMX/LA,BMX/MASK,SPO.R7WRITE.RAB,SPO.RAB/@1,SHF/ALU"
R[]_LA.OR.D     "AMX/LA,RBMX/D,BMX/RBMX,ALU/OR,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA.ORNOT.MASK       "AMX/LA,BMX/MASK,ALU/ORNOT,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1'
R[]_LA+Q        "AMX/LA,RBMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LA-Q        "AMX/LA,RBMX/Q,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LB          "BMX/LB,ALU/B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LC          "BMX/LC,ALU/B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_LC.RIGHT    "BMX/LC,ALU/B,SHF/RIGHT,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_NOT.0       "AMX/RAMX.OXT,DT/LONG,ALU/NOTA,R[@1]_ALU"
R[]_NOT.D       "RAMX/D,AMX/RAMX,ALU/NOTA,R[@1]_ALU"
R[]_NOT.MASK    "BMX/MASK,AMX/RAMX.OXT,DT/LONG,ALU/ORNOT,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]_NOT.Q       "RAMX/Q,AMX/RAMX,ALU/NOTA,R[@1]_ALU"
R[]_PACK.FP     "BMX/PACKED.FL,ALU/B,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
```

```
R[]_Q           ''SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU''
R[]_Q+1         ''ALU_0+Q+1,R[@1]_ALU''
R[]_Q+5         ''SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/A+B+1,BMX/KMX,KMX/.4,AMX/RAMX,RAMX/Q,SHF/ALU''
R[]_Q-D         ''SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU''
R[]_Q-D-1       ''SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/A-B-1,AMX/RAMX,RAMX/Q,BMX/RBMX,RBMX/D,SHF/ALU''
R[]_Q+K[]       ''SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A+B,SHF/ALU''
R[]_Q-K[]       ''SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A-B,SHF/ALU''
R[]_Q-K[].RLOG  ''RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A-B.RLOG,DT/LONG,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1''
R[]_Q+LB        ''SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/A+B,AMX/RAMX,BMX/LB,RAMX/Q,SHF/ALU''
R[]_Q+LC        ''SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/Q,AMX/RAMX,BMX/LC,ALU/A+B,SHF/ALU''
R[]_Q-LC        ''SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/Q,AMX/RAMX,BMX/LC,ALU/A-B,SHF/ALU''
R[]_Q.AND.K[]   ''ALU/AND,SPO.R/WRITE.RAB,SPO.RAB/@1,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/@2''
R[]_Q.ANDNOT.K[]        ''SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/ANDNOT,AMX/RAMX,RAMX/Q,BMX/KMX,KMX/@2,SHF/ALU''
R[]_Q.OR.D      ''SPO.R/WRITE.RAB,SPO.RAB/@1,ALU/OR,AMX/RAMX,RAMX/Q,BMX/RBMX,RBMX/D,SHF/ALU''
R[]_Q.ORNOT.K[] ''SPO.R/WRITE.RAB,SPO.RAB/@1,RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/ORNOT,SHF/ALU''
R[]_Q.RIGHT.1   ''ALU_Q,SHF/RIGHT,SPO.R/WRITE.RAB,SPO.RAB/@1''
R[]_RLOG.RIGHT.1        ''BMX/0,MSC/READ.RLOG,ALU/B,SHF/RIGHT,SPO.R/WRITE.RAB,SPO.RAB/@1''
```

```
RC[]_0          "AMX/RAMX.OXT,DT/LONG,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_0-D        "AMX/RAMX.OXT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_0+K[]+1    "AMX/RAMX.OXT,DT/LONG,KMX/@2,BMX/KMX,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_0+LC+1     "AMX/RAMX.OXT,DT/LONG,BMX/LC,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_0+MASK+1   "AMX/RAMX.OXT,DT/LONG,BMX/MASK,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_0+MASK+1.RIGHT2    "AMX/RAMX.OXT,DT/LONG,BMX/MASK,ALU/A+B+1,SHF/RIGHT2,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_ALU        "SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_ALU.LEFT   "SHF/LEFT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_ALU.LEFT2  "SPO.R/WRITE.RC,SPO.RC/@1,SHF/ALU.DT,DT/LONG"
RC[]_ALU.LEFT3  "SPO.R/WRITE.RC,SPO.RC/@1,SHF/LEFT3"
RC[]_ALU.RIGHT  "SHF/RIGHT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D          "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.OXT[]    "RAMX/D,AMX/RAMX.OXT,DT/@2,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.AND.K[]  "RAMX/D,AMX/RAMX,BMX/KMX,KMX/@2,ALU/AND,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.AND.MASK "RAMX/D,AMX/RAMX,BMX/MASK,ALU/AND,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.ANDNOT.Q "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/ANDNOT,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D(B)       "RBMX/D,BMX/RBMX,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.CTX      "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU.DT,DT/INST.DEP,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D+K[]      "RAMX/D,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A+B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D-K[]      "RAMX/D,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A-B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.LEFT     "RAMX/D,AMX/RAMX,ALU/A,SHF/LEFT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.LEFT3    "RAMX/D,AMX/RAMX,ALU/A,SHF/LEFT3,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.OR.K[]   "RAMX/D,AMX/RAMX,KMX/@2,BMX/KMX,ALU/OR,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.OR.Q     "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/OR,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_D.ORNOT.K[]        "SPO.RC/@1,SPO.R/WRITE.RC,ALU/ORNOT,AMX/RAMX,RAMX/D,BMX/KMX,KMX/@2,SHF/ALU"
RC[]_D.SXT[]    "RAMX/D,AMX/RAMX.SXT,DT/@2,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
```

```
RC[]_K[]         "KMX/@2,BMX/KMX,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_K[]+1       "AMX/RAMX.OXT,DT/LONG,KMX/@2,BMX/KMX,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_K[].LEFT2   "KMX/@2,BMX/KMX,ALU/B,SHF/ALU.DT,DT/LONG,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_K[].RIGHT2  "KMX/@2,BMX/KMX,ALU/B,SHF/RIGHT2,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LA          "AMX/LA,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LA.AND.K[]          "ALU_LA.AND.K[@2],RC[@1]_ALU"
RC[]_LA.CTX      "AMX/LA,ALU/A,SHF/ALU.DT,DT/INST.DEP,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LA-K[]      "AMX/LA,KMX/@2,BMX/KMX,ALU/A-B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LB          "BMX/LB,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LB.LEFT     "BMX/LB,ALU/B,SHF/LEFT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_LC          "BMX/LC,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_NOT.Q       "RAMX/Q,AMX/RAMX,ALU/NOTA,RC[@1]_ALU"
RC[]_PACK.FP     "BMX/PACKED.FL,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_PC          "BMX/PC,ALU/B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q           "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.OXT[]     "RAMX/Q,AMX/RAMX.OXT,DT/@2,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.AND.K[]   "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/AND,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.ANDNOT.K[]        "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/ANDNOT,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q+1         "ALU_0+Q+1,RC[@1]_ALU"
RC[]_Q+K[]       "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A+B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q-K[]       "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@2,ALU/A-B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.LEFT      "RAMX/Q,AMX/RAMX,ALU/A,SHF/LEFT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.LEFT3     "RAMX/Q,AMX/RAMX,ALU/A,SHF/LEFT3,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q-MASK-1    "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/A-B-1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q+PC        "RAMX/Q,AMX/RAMX,BMX/PC,ALU/A+B,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q+PC+1      "RAMX/Q,AMX/RAMX,BMX/PC,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.RIGHT     "RAMX/Q,AMX/RAMX,ALU/A,SHF/RIGHT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_Q.SXT[]     "RAMX/Q,AMX/RAMX.SXT,DT/@2,ALU/A,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]_RLOG.RIGHT  "BMX/0,MSC/READ.RLOG,ALU/B,SHF/RIGHT,SPO.R/WRITE.RC,SPO.RC/@1"
RC[]&VA_D+Q      "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B,VAK/LOAD,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
RC(SC)_ALU       "SHF/ALU,SPO/WRITE.RC.SC"
```

```
R(DST)_ALU       "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/DST.DST"
R(DST)_D         "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/DST.DST"
R(DST)_D.SXT[].RIGHT     "RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A,SHF/RIGHT,SPO.AC/WRITE.RAB,SPO.ACN11/DST.DST"
R(PRN)_ALU       "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_D         "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_D.OR.Q    "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/OR,R(PRN)_ALU"
R(PRN)_D[]Q      "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/@1,R(PRN)_ALU"
R(PRN)_D+K[].RLOG "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B.RLOG,DT/LONG,R(PRN)_ALU"
R(PRN)_D-K[].RLOG "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B.RLOG,DT/LONG,R(PRN)_ALU"
R(PRN)_K[]       "KMX/@1,BMX/KMX,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_LA+K[].RLOG      "AMX/LA,KMX/@1,BMX/KMX,ALU/A+B.RLOG,DT/LONG,R(PRN)_ALU"
R(PRN)_LA-K[].RLOG      "AMX/LA,KMX/@1,BMX/KMX,ALU/A-B.RLOG,DT/LONG,R(PRN)_ALU"
R(PRN)_LA[]MASK "AMX/LA,BMX/MASK,ALU/@1,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_LA+Q      "AMX/LA,RBMX/Q,BMX/RBMX,ALU/A+B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_PACK.FP   "BMX/PACKED.FL,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN)_Q         "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN"
R(PRN+1)_D       "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN+1"
R(PRN+1)_D.OR.Q "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/OR,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN+1"
R(PRN+1)_LC      "BMX/LC,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN+1"
R(PRN+1)_Q       "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/PRN+1"
R(SC)_ALU        "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SC"
R(SC)_D          "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SC"
R(SC)_LA+D       "AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SC"
R(SC)_LA-D       "AMX/LA,RBMX/D,BMX/RBMX,ALU/A-B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SC"
R(SC)_LC                "ALU_LC,R(SC)_ALU"
R(SC)_Q          "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SC"
R(SP1+1)_LC      "BMX/LC,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1+1"
R(SP1+1)_Q       "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1+1"
R(SP1)_ALU       "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1.SP1"
R(SP1)_D         "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1.SP1"
R(SP1)_K[]       "KMX/@1,BMX/KMX,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1.SP1"
R(SP1)_PACK.FP   "BMX/PACKED.FL,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1.SP1"
R(SP1)_Q         "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN/SP1.SP1"
R(SRC)_ALU       "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.SRC"
R(SRC)_D         "RAMX/D,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.SRC"
R(SRC)_D(B)      "RBMX/D,BMX/RBMX,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.SRC"
R(SRC)_D+K[].RLOG "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B.RLOG,DT/WORD,R(SRC)_ALU"
R(SRC)_D-K[].RLOG "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B.RLOG,DT/WORD,R(SRC)_ALU"
R(SRC)_LC        "BMX/LC,ALU/B,R(SRC)_ALU"
R(SRC)_Q         "RAMX/Q,AMX/RAMX,ALU/A,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.SRC"
R(SRC!1)_ALU     "SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.OR.1"
R(SRC!1)_D(B)    "RBMX/D,BMX/RBMX,ALU/B,SHF/ALU,SPO.AC/WRITE.RAB,SPO.ACN11/SRC.OR.1"
R[]&VA_LA+K[]    "AMX/LA,KMX/@2,BMX/KMX,ALU/A+B,VAK/LOAD,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]&VA_LA-K[]    "AMX/LA,KMX/@2,BMX/KMX,ALU/A-B,VAK/LOAD,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]&VA_LA-K[].RLOG      "AMX/LA,KMX/@2,BMX/KMX,ALU/A-B.RLOG,DT/LONG,VAK/LOAD,SHF/ALU,SPO.R/WRITE.RAB,SPO.RAB/@1"
R[]&VA_Q-K[]     "RAMX/Q,AMX/RAMX,KMX/@2,BMX/KMX,ALU/A-B,VAK/LOAD,SPO.R/WRITE.RAB,SPO.RAB/@1"
```

```
SC_O(A)         "AMX/RAMX.OXT,DT/LONG,EBMX/AMX.EXP,EALU/B,SMX/EALU,SCK/LOAD"
SC_O-K[]        "BMX/KMX,KMX/@1,AMX/RAMX.OXT,DT/LONG,ALU/A-B,SMX/ALU,SCK/LOAD"
SC_ALU          "SMX/ALU,SCK/LOAD"
SC_ALU(EXP)     "SMX/ALU.EXP,SCK/LOAD"
SC_D            "RAMX/D,AMX/RAMX,ALU/A,SMX/ALU,SCK/LOAD"
SC_D.OXT[]-K[]  "RAMX/D,AMX/RAMX.OXT,DT/@1,KMX/@2,BMX/KMX,ALU/A-B,SMX/ALU,SCK/LOAD"
SC_D.OXT[].XOR.K[]      "RAMX/D,AMX/RAMX.OXT,DT/@1,BMX/KMX,KMX/@2,ALU/XOR,SC_ALU"
SC_D.AND.K[]    "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/AND,SMX/ALU,SCK/LOAD"
SC_D(EXP)       "RAMX/D,AMX/RAMX,ALU/A,SMX/ALU.EXP,SCK/LOAD"
SC_D(EXP)(A)    "RAMX/D,AMX/RAMX,EBMX/AMX.EXP,EALU/B,SMX/EALU,SCK/LOAD"
SC_D(EXP)(B)    "RBMX/D,BMX/RBMX,ALU/B,SMX/ALU.EXP,SCK/LOAD"
SC_D-K[]        "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,SMX/ALU,SCK/LOAD"
SC_D.OR.K[]     "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/OR,SMX/ALU,SCK/LOAD"
SC_D.SXT[]      "RAMX/D,AMX/RAMX.SXT,DT/@1,ALU/A,SMX/ALU,SCK/LOAD"
SC_EALU         "SMX/EALU,SCK/LOAD"
SC_FE           "SMX/FE,SCK/LOAD"
SC_NABS(SC-FE)  "EBMX/FE,EALU/NABS.A-B,SMX/EALU,SCK/LOAD"
SC_K[]          "KMX/@1,EBMX/KMX,EALU/B,SMX/EALU,SCK/LOAD"
SC_K[].ALU      "KMX/@1,BMX/KMX,ALU/B,SMX/ALU,SCK/LOAD"
SC_LA           "AMX/LA,ALU/A,SMX/ALU,SCK/LOAD"
SC_LA.AND.K[]   "AMX/LA,KMX/@1,BMX/KMX,ALU/AND,SMX/ALU,SCK/LOAD"
SC_LC(EXP)      "BMX/LC,ALU/B,SMX/ALU.EXP,SCK/LOAD"
SC_PSLADDR      "SMX/EALU,EBMX/KMX,SCK/LOAD,KMX/.F,EALU/B"
SC_Q            "RAMX/Q,AMX/RAMX,ALU/A,SMX/ALU,SCK/LOAD"
SC_Q.AND.K[]    "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@1,ALU/AND,SMX/ALU,SCK/LOAD"
SC_Q(EXP)       "RAMX/Q,AMX/RAMX,EBMX/AMX.EXP,EALU/B,SMX/EALU,SCK/LOAD"
SC_Q(EXP)(B)    "RBMX/Q,BMX/RBMX,ALU/B,SMX/ALU.EXP,SCK/LOAD"
SC_Q+K[]        "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@1,ALU/A+B,SMX/ALU,SCK/LOAD"
SC_Q-K[]        "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@1,ALU/A-B,SMX/ALU,SCK/LOAD"
SC_Q.OR.K[]     "RAMX/Q,AMX/RAMX,BMX/KMX,KMX/@1,ALU/OR,SMX/ALU,SCK/LOAD"
SC_Q.SXT[]      "RAMX/Q,AMX/RAMX.SXT,DT/@1,ALU/A,SMX/ALU,SCK/LOAD"
SC_R[]          "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SMX/ALU,SCK/LOAD"
SC_RC[]         "SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,SMX/ALU,SCK/LOAD"
SC_R[].AND.K[]  "ALU/AND,AMX/LA,SPO.R/LOAD.LAB,SPO.RAB/@1,BMX/KMX,KMX/@2,SMX/ALU,SCK/LOAD"
SC_R[](EXP)     "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SMX/ALU.EXP,SCK/LOAD"
SC_RC[](EXP)    "SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,SMX/ALU.EXP,SCK/LOAD"
SC_SC+1         "EALU/A+1,SMX/EALU,SCK/LOAD"
SC_SC.ANDNOT.FE "EBMX/FE,EALU/ANDNOT,SMX/EALU,SCK/LOAD"
SC_SC.ANDNOT.K[]        "KMX/@1,EBMX/KMX,EALU/ANDNOT,SMX/EALU,SCK/LOAD"
SC_SC+FE        "EBMX/FE,EALU/A+B,SMX/EALU,SCK/LOAD"
SC_SC-FE        "EBMX/FE,EALU/A-B,SMX/EALU,SCK/LOAD"
SC_SC+K[]       "KMX/@1,EBMX/KMX,EALU/A+B,SMX/EALU,SCK/LOAD"
SC_SC-K[]       "KMX/@1,EBMX/KMX,EALU/A-B,SMX/EALU,SCK/LOAD"
SC_SC.OR.K[]    "KMX/@1,EBMX/KMX,EALU/OR,SMX/EALU,SCK/LOAD"
SC_SC-SHF.VAL   "EBMX/SHF.VAL,EALU/A-B,SMX/EALU,SCK/LOAD"
SC_SHF.VAL      "EBMX/SHF.VAL,EALU/B,SMX/EALU,SCK/LOAD"
SC_STATE        "EALU/A,MSC/LOAD.STATE,SMX/EALU,SCK/LOAD"
SC_STATE.ANDNOT.K[]     "EALU/ANDNOT,EBMX/KMX,MSC/LOAD.STATE,SMX/EALU,SCK/LOAD,KMX/@1"
SC&STATE_STATE-R[](EXP) "LAB_R[@1],AMX/LA,EBMX/AMX.EXP,MSC/LOAD.STATE,EALU/A-B,SMX/EALU,SCK/LOAD"
```

```
SD_NOT.SD       "SGN/NOT.SD"
SD_SS           "SGN/SD.FROM.SS"
SS_0&SD_0       "SGN/CLR.SD+SS"
SS_ALU15        "SGN/LOAD.SS"
SS_SD           "SGN/SS.FROM.SD"
SS_SS.XOR.ALU15&SD_ALU15        "SGN/SS.XOR.ALU"

STATE_0(A)      "AMX/RAMX.0XT,DT/LONG,EBMX/AMX.EXP,EALU/B,MSC/LOAD.STATE"
STATE_AMX.EXP   "EBMX/AMX.EXP,EALU/B,MSC/LOAD.STATE"
STATE_D(EXP)    "RAMX/D,AMX/RAMX,EBMX/AMX.EXP,EALU/B,MSC/LOAD.STATE"
STATE_FE        "EBMX/FE,EALU/B,MSC/LOAD.STATE"
STATE_K[]       "KMX/@1,EBMX/KMX,EALU/B,MSC/LOAD.STATE"
STATE_Q(EXP)    "RAMX/Q,AMX/RAMX,EBMX/AMX.EXP,EALU/B,MSC/LOAD.STATE"
STATE_SC.VIA.KMX        "MSC/LOAD.STATE,EALU/B,EBMX/KMX,KMX/SC"
STATE_STATE+1   "EALU/A+1,MSC/LOAD.STATE"
STATE_STATE.ANDNOT.FE   "EBMX/FE,EALU/ANDNOT,MSC/LOAD.STATE"
STATE_STATE.ANDNOT.K[]  "KMX/@1,EBMX/KMX,EALU/ANDNOT,MSC/LOAD.STATE"
STATE_STATE+FE  "EBMX/FE,EALU/A+B,MSC/LOAD.STATE"
STATE_STATE-FE  "EBMX/FE,EALU/A-B,MSC/LOAD.STATE"
STATE_STATE+K[] "KMX/@1,EBMX/KMX,EALU/A+B,MSC/LOAD.STATE"
STATE_STATE-K[] "KMX/@1,EBMX/KMX,EALU/A-B,MSC/LOAD.STATE"
STATE_STATE.OR.FE       "EALU/OR,EBMX/FE,MSC/LOAD.STATE"
STATE_STATE.OR.K[]      "KMX/@1,EBMX/KMX,EALU/OR,MSC/LOAD.STATE"
;SKPC_STATES
STATE_SKPLONG           "STATE_K[.4]"
STATE_STATE.AN.SKPLONG  "STATE_STATE.ANDNOT.K[.4]"
;EDITPC STATES
STATE_FIRST             "STATE_K[ZERO]"
STATE_PREDEC            "STATE_K[.80]"
STATE_STATE.AN.5TO0     "STATE_STATE.ANDNOT.K[.3F]"
STATE_STATE.AN.6TO4     "STATE_STATE.ANDNOT.K[.7F]"
STATE_STATE.AN.DESTDBL  "STATE_STATE.ANDNOT.K[.6]"
STATE_STATE.AN.NOTPREDEC        "STATE_STATE.ANDNOT.K[.7F]"
STATE_STATE.AN.PREDECZERO       "STATE_STATE.ANDNOT.K[.C0]"
STATE_STATE.OR.ADJINP   "STATE_STATE.OR.K[.3]"
STATE_STATE.OR.DEST     "STATE_STATE.OR.K[.4]"
STATE_STATE.OR.DESTDBL  "STATE_STATE.OR.K[.6]"
STATE_STATE.OR.FILL     "STATE_STATE.OR.K[.7]"
STATE_STATE.OR.FLOAT    "STATE_STATE.OR.K[.60]"
STATE_STATE.OR.MOVE     "STATE_STATE.OR.K[.50]"
STATE_STATE.OR.PATT1    "STATE_STATE.OR.K[.1]"
STATE_STATE.OR.PATT2    "STATE_STATE.OR.K[.2]"
;MATCHC STATES
STATE_INNEROBJ  "STATE_K[.1]"
STATE_INNERSRC  "STATE_K[.3]"
STATE_OUTER     "STATE_K[ZERO]"

SWAPD           "DK/BYTE.SWAP"

VA_ALU          "VAK/LOAD"
VA_D            "RAMX/D,AMX/RAMX,ALU/A,VAK/LOAD"
VA_D.0XT[]+Q    "RAMX/D,AMX/RAMX.0XT,DT/@1,BMX/RBMX,ALU/A+B,VAK/LOAD"
VA_D.ANDNOT.K[] "RAMX/D,AMX/RAMX,BMX/KMX,KMX/@1,ALU/ANDNOT,VAK/LOAD"
VA_D+K[]        "RAMX/D,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,VAK/LOAD"
VA_D+LC         "RAMX/D,AMX/RAMX,BMX/LC,ALU/A+B,VAK/LOAD"
VA_D+Q          "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B,VAK/LOAD"
VA_K[]          "KMX/@1,BMX/KMX,ALU/B,VAK/LOAD"
VA_LA           "AMX/LA,ALU/A,VAK/LOAD"
```

```
VA_LA.AND.LC      "AMX/LA,BMX/LC,ALU/AND,VAK/LOAD"
VA_LA.ANDNOT.K[]          "AMX/LA,BMX/KMX,KMX/@1,ALU/ANDNOT,VAK/LOAD"
VA_LA+D          "AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B,VAK/LOAD"
VA_LA-D          "AMX/LA,RBMX/D,BMX/RBMX,ALU/A-B,VAK/LOAD"
VA_LA+K[]        "AMX/LA,BMX/KMX,KMX/@1,ALU/A+B,VAK/LOAD"
VA_LA-K[]        "AMX/LA,BMX/KMX,KMX/@1,ALU/A-B,VAK/LOAD"
VA_LA+K[]+1      "AMX/LA,BMX/KMX,KMX/@1,ALU/A+B+1,VAK/LOAD"
VA_LA-K[]-1      "AMX/LA,BMX/KMX,KMX/@1,ALU/A-B-1,VAK/LOAD"
VA_LA+PC         "AMX/LA,BMX/PC,ALU/A+B,VAK/LOAD"
VA_LA+Q          "AMX/LA,RBMX/Q,BMX/RBMX,ALU/A+B,VAK/LOAD"
VA_LA-Q          "VAK/LOAD,ALU/A-B,AMX/LA,BMX/RBMX,RBMX/Q,SHF/ALU"
VA_LB+D.OXT      "BMX/LB,ALU/A+B,AMX/RAMX.OXT,DT/BYTE,VAK/LOAD"
VA_PC            "BMX/PC,ALU/B,VAK/LOAD"
VA_Q             "RAMX/Q,AMX/RAMX,ALU/A,VAK/LOAD"
VA_Q.ANDNOT.K[]  "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/ANDNOT,VAK/LOAD"
VA_Q+D           "VAK/LOAD,ALU/A+B,AMX/RAMX,BMX/RBMX,RAMX/Q,RBMX/D,SHF/ALU"
VA_Q+K[]         "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A+B,VAK/LOAD"
VA_Q-K[]         "RAMX/Q,AMX/RAMX,KMX/@1,BMX/KMX,ALU/A-B,VAK/LOAD"
VA_Q+LC          "RAMX/Q,AMX/RAMX,BMX/LC,ALU/A+B,VAK/LOAD"
VA_Q+LB          "RAMX/Q,AMX/RAMX,BMX/LB,ALU/A+B,VAK/LOAD"
VA_Q-LB          "RAMX/Q,AMX/RAMX,BMX/LB,ALU/A-B,VAK/LOAD"
VA_Q+LB.PC       "RAMX/Q,AMX/RAMX,BMX/PC.OR.LB,ALU/A+B,VAK/LOAD"
VA_Q+PC          "RAMX/Q,AMX/RAMX,BMX/PC,ALU/A+B,VAK/LOAD"
VA_R[]           "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,VAK/LOAD"
VA_RC[]          "SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU/B,VAK/LOAD"
VA_VA+4          "PCK/VA+4"
```

```
B.FORK          "LAB_R(SP1),QK/ID,CLR.IB.COND,PC_PC+N,SUB/SPEC,J/B.FORK"
BYTE            "DT/BYTE"
CACHE.INVALIDATE        "MCT/INVALIDATE,VAK/NOP"
CALL            "SUB/CALL"
CALL[]          "CALL,J/@1"
C.FORK          "SUB/SPEC,J/C.FORK"
CHK.ODD.ADDR    "MSC/CHK.ODD.ADDR"
CHK.FLT.OPR     "MSC/CHK.FLT.OPR"
CLK.UBCC        "CCK/LOAD.UBCC"
CLR.FPD         "MSC/CLR.FPD"
CLR.IB0-1       "IBC/CLR.0.1,IEK/ISTR"
CLR.IB0-3       "IBC/CLR.0-3"            ;DISCARD -11 INSTR & OPERAND
CLR.IB2-3       "IBC/CLR.2.3"            ;11 MODE DISCARD ISTREAM OPERAND
CLR.IB2-5       "IBC/CLR.1-5.COND"       ;2ND PART OF Q/D IMMEDIATE
CLR.IB.COND     "IBC/CLR.1-5.COND"
CLR.IB.OPC      "IBC/CLR.0,IEK/ISTR"
CLR.IB.SPEC     "IBC/CLR.1"
CLR.NEST.ERR    "MSC/CLR.NEST.ERR"
CLR.SD&SS       "SGN/CLR.SD+SS"
EXCEPT.ACK      "IEK/EACK"
FLUSH.IB        "IBC/FLUSH,VAK/LOAD,IEK/ISTR"
INHIBIT.IB      "MCT/MEM.NOP"
INTRPT.ACK      "IEK/IACK"
INTRPT.STROBE   "IEK/ISTR"
IRD             "IRD0,CLK.UBCC,IRD1,SUB/SPEC,J/A.FORK"
IRD0            "LA_R(SP2)&LB_R(SP1),D&VA_LB,SC_ALU(EXP),FE_LA(EXP),SS_ALU15"
IRD1            "MSC/IRD,QK/ID,MCT/ALLOW.IB.READ,IBC/CLR.1-5.COND,PCK/PC+N"
IRD.11          "LA_R(DST)&LB_R(SRC),D_LB.PC,VAK/LOAD,Q_IB.DATA,SC_K[.10],PCK/PC+N,MSC/IRD,SUB/SPEC,J/DP0"
LOAD.IB         "VAK/NOP,MCT/READ.V.NEWPC"
LOAD.IB.11      "VAK/NOP,MCT/READ.V.NEWPC"
LONG            "DT/LONG"
POLY.DONE       "ACF/CONTROL,ACM/POLY.DONE"
```

```
RETURN0         "SUB/RET,J/0"
RETURN1         "SUB/RET,J/1"
RETURN2         "SUB/RET,J/2"
RETURN3         "SUB/RET,J/3"
RETURN8         "SUB/RET,J/8"
RETURN9         "SUB/RET,J/9"
RETURNF         "SUB/RET,J/0F"
RETURN10        "SUB/RET,J/10"
RETURN12        "SUB/RET,J/12"
RETURN18        "SUB/RET,J/18"
RETURN1F        "SUB/RET,J/1F"
RETURN20        "SUB/RET,J/20"
RETURN24        "SUB/RET,J/24"
RETURN40        "SUB/RET,J/40"
RETURN60        "SUB/RET,J/60"
RETURN61        "SUB/RET,J/61"
RETURN100       "SUB/RET,J/100"
RETURN10C       "SUB/RET,J/10C"
RETURN10E       "SUB/RET,J/10E"
SET.CC(INST)    "CCK/INST.DEP,DT/INST.DEP"
SET.CC(LONG)    "CCK/INST.DEP,DT/LONG"
SET.CC(ROR)     "CCK/ROR"
SET.FPD         "MSC/SET.FPD"
SET.N.AND.Z     "CCK/TST.Z"
SET.NEST.ERR    "MSC/SET.NEST.ERR"
SET.N&Z         "CCK/N+Z_ALU"
SET.PSL.C(AMX)  "CCK/C_AMX0"
SET.V           "CCK/SET.V"
START.IB        "IBC/START"
STOP.IB         "IBC/STOP"
TEST.TB.RCHK    "MCT/TEST.RCHK,VAK/NOP"
TEST.TB.WCHK    "MCT/TEST.WCHK,VAK/NOP"
TRAP.ACC[]      "ACF/TRAP,ACM/@1"
WORD            "DT/WORD"
WRITE.DEST      "LAB_R(SP1),QK/ID,CLR.IB.COND,PC_PC+N,SUB/SPEC,J/WRD"
```

```
ACCEL?          "BEN/ACCEL"
ACC.SYNC?       "BEN/ACCEL"       ;,J3/3"
AC.LOW?         "BEN/INTERRUPT"   ;,J3/3"
ALIGNED?        "BEN/TB.TEST"     ;,J5/17"
ALU?            "BEN/ALU"
ALU.N?          "BEN/ALU"         ;,J4/07"
ALU1-0?         "BEN/ALU1-0"
BCDSGN?         "BEN/DECIMAL"     ;,J2/2"
C31?            "BEN/C31"
CONSOLE.MODE?   "BEN/PSL.MODE"    ;,J5/1B"
D0?             "BEN/D3-0"        ;,J4/0E"
D(1)?           "BEN/MUL"
D2?             "BEN/D3-0"        ;,J4/0B"
D2-0?           "BEN/D3-0"        ;,J4/08"
D3?             "BEN/D3-0"        ;,J4/07"
D3-0?           "BEN/D3-0"
D31?            "BEN/SIGNS"       ;,J3/6"
DATA.TYPE?      "BEN/DATA.TYPE"
D.B0?           "BEN/D.BYTES"     ;,J4/0E"
D.B1?           "BEN/D.BYTES"     ;,J4/0D"
D.B2?           "BEN/D.BYTES"     ;,J4/0B"
DBL?            "BEN/DATA.TYPE"
D.BYTES?        "BEN/D.BYTES"
D.NE.0?         "BEN/SIGNS"       ;,J3/5" ;PREFERED FORM
EALU?           "BEN/EALU"
EALU.N?         "BEN/EALU"        ;,J4/07"
EALU.Z?         "BEN/EALU"        ;,J4/0B"
END.DP1?        "BEN/END.DP1"
FPD?            "BEN/LAST.REF"    ;,J4/07"
```

```
INT?            "BEN/INTERRUPT"
INTERRUPT.REQ?  "BEN/INTERRUPT" ;,J3/5"
IRO?            "BEN/ALU"       ;,J4/0D"
IRO.C31?        "BEN/ALU"
IR1?            "BEN/IR2-1"     ;,J3/6"
IR2-1?          "BEN/IR2-1"
LAST.REF?       "BEN/LAST.REF"
MODE.LSS.ASTLVL?        "BEN/REI"       ;,J3/3"
MUL?            "BEN/MUL"
NEST.ERR?       "BEN/LAST.REF"  ;,J4/0B"
PC.MODES?       "BEN/PC.MODES"
PSL.C?          "BEN/PSL.CC"    ;,J4/0E"
PSL.CC?         "BEN/PSL.CC"
PSL.MODE?       "BEN/PSL.MODE"
PSL.N?          "BEN/PSL.CC"    ;,J4/7"
PSL.V?          "BEN/PSL.CC"    ;,J4/0D"
PSL.Z?          "BEN/PSL.CC"    ;,J4/0B"
PTE.VALID?      "BEN/TB.TEST"   ;,J5/0F"
QUAD?           "BEN/DATA.TYPE"
Q31?            "BEN/SIGNS"     ;,J3/3"
RLOG.EMPTY?     "BEN/ALU1-0"    ;,J4/7"
ROR?            "BEN/ROR"
SC?             "BEN/SC"
SC.GT.0?        "BEN/SC"
SC.NE.0?        "BEN/MUL"       ;,J3/3"
SIGNS?          "BEN/SIGNS"
SRC.PC?         "BEN/SRC.PC"    ;COMP MODE, BEN ON SRC R = PC
SS?             "BEN/EALU"      ;,J4/0E"
STATE0?         "BEN/STATE3-0"  ;,J4/0E"
STATE1?         "BEN/STATE3-0"  ;,J4/0D"
STATE1-0?       "BEN/STATE3-0"  ;,J4/0C"
STATE2?         "BEN/STATE3-0"  ;,J4/0B"
STATE3?         "BEN/STATE3-0"  ;,J4/07"
STATE3-0?       "BEN/STATE3-0"
STATE4?         "BEN/STATE7-4"
STATE5?         "BEN/STATE7-4"
STATE6?         "BEN/STATE7-4"
STATE(7)?               "STATE7-4?"
STATE7-4?       "BEN/STATE7-4"
TB.TEST?        "BEN/TB.TEST"
VA31?           "BEN/PSL.MODE"  ;,J5/0F"
VA31-30?        "BEN/PSL.MODE"  ;,J5/07"
Z?              "BEN/Z"
ZONED?          "BEN/DECIMAL"   ;,J2/1"

.BIN            ;MAKE LISTING ROOM FOR BINARY FROM HERE ON
```

```
        ALEG_D          "AMX/RAMX,RAMX/D"
        ALEG_LA         "AMX/LA"
        ALEG_LAB        "AMX/LA"
        ALEG_Q          "AMX/RAMX,RAMX/Q"
        ALU_0(K)        "KMX/ZERO,BMX/KMX,ALU/B"
        ALU_0+D+1       "AMX/RAMX.0XT,DT/LONG,RBMX/D,BMX/RBMX,ALU/A+B+1"
        ALU_D.AND.Q     "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/AND"
        ALU_D.OR.MASK   "RAMX/D,AMX/RAMX,BMX/MASK,ALU/OR"
        ALU_D[]LB       "RAMX/D,AMX/RAMX,BMX/LB,ALU/@1"
        ALU_D[]MASK     "RAMX/D,AMX/RAMX,BMX/MASK,ALU/@1"
        ALU_D[]RC[]     "AMX/RAMX,RAMX/D,LC_RC[@2],BMX/LC,ALU/@1"
        ALU_D[]RC(SC)   "SPO/LOAD.LC.SC,BMX7LC,AMX/RAMX,RAMX/D,ALU/@1"
        ALU_D[]R[]      "AMX/RAMX,RAMX/D,LAB_R[@2],BMX/LB,ALU/@1"
        ALU_D-R[]       "BMX/RBMX,RBMX/D,LAB_R[@1],AMX/LA,ALU/A-B"
        ALU_LA-LC       "AMX/LA,BMX/LC,ALU/A-B"
        ALU_LA.AND.LC   "AMX/LA,BMX/LC,ALU/AND"
        ALU_LA[]K[]     "AMX/LA,BMX/KMX,KMX/@2,ALU/@1"
        ALU_LA[]LC      "AMX/LA,BMX/LC,ALU/@1"
        ALU_LA.XOR.RC[] "SPO.R/LOAD.LC,SPO.RC/@1,AMX/LA,BMX/LC,ALU/XOR"
        ALU_MASK        "BMX/MASK,ALU/B"
        ALU_MASK+1      "AMX/RAMX.0XT,DT/LONG,BMX/MASK,ALU/A+B+1"
        ALU_NOT.K[]     "AMX/RAMX.0XT,DT/LONG,KMX/@1,BMX/KMX,ALU/ORNOT"
        ALU_NOT.LA      "AMX/LA,ALU/NOTA"
        ALU_NOT.MASK    "AMX/RAMX.0XT,DT/LONG,BMX/MASK,ALU/ORNOT"
        ALU_NOT.Q       "RAMX/Q,AMX/RAMX,ALU/NOTA"
        ALU_NOT.R[]     "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/NOTA"
        ALU_Q+D+1       "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/A+B+1"
        ALU_Q.0XT[].XOR.K[]     "ALU/XOR,AMX/RAMX.0XT,DT/@1,RAMX/Q,BMX/KMX,KMX/@2"
        ALU_Q+D         "RAMX/Q,AMX/RAMX,BMX/RBMX,ALU/A+B"
        ALU_Q-SC        "KMX/SC,BMX/KMX,RAMX/Q,AMX/RAMX,ALU/A-B"
        ALU_Q[]LB       "RAMX/Q,AMX/RAMX,BMX/LB,ALU/@1"
        ALU_Q[]MASK     "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/@1"
        ALU_Q.AND.MASK  "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/AND"
        ALU_Q.OR.MASK   "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/OR"
        alu_q.or.rc[]   "lc_rc[@1],amx/ramx,ramx/q,bmx/lc,alu/or"
        ALU_Q.ORNOT.MASK        "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/ORNOT"
        ALU_Q.XOR.RC[]  "LC_RC[@1],AMX/RAMX,RAMX/Q,BMX/LC,ALU/XOR"
        ALU_Q.XOR.R(SC) "LAB_R(SC),BMX/LB,AMX/RAMX,RAMX/Q,ALU/XOR"
        ALU_Q[]K[]      "RAMX/Q,AMX/RAMX,KMX/@2,BMX/KMX,ALU/@1"
        ALU_Q[]LC       "RAMX/Q,AMX/RAMX,BMX/LC,ALU/@1"
        ALU_Q[]RC[]     "AMX/RAMX,RAMX/Q,LC_RC[@2],BMX/LC,ALU/@1"
        ALU_Q[]R[]      "AMX/RAMX,RAMX/Q,LAB_R[@2],BMX/LB,ALU/@1"
        ALU_R(SC)       "SPO.AC/LOAD.LAB,SPO_ACN/SC,AMX/LA,ALU/A"
        ALU_R(SC)[]K[]  "LAB_R(SC),AMX/LA,ALU/@1,BMX/KMX,KMX/@2"
        ALU_RLOG        "MSC7READ.RLOG,ALU/B"
        ALU_R[][]K[]    "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@3,BMX/KMX,ALU/@2"
        ALU_R[][]Q      "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,RBMX/Q,BMX/RBMX,ALU/@2"
        ALU_R[].AND.MASK        "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,BMX/MASK,ALU/AND"
        ALU_R[].OR.MASK "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,BMX/MASK,ALU/OR"
        ALU_R[].ORNOT.MASK      "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,BMX/MASK,ALU/ORNOT"
        alu_r[].xor.d   "alu/xor,amx/la,spo.r/load.lab,spo.rab/@1,bmx/rbmx,rbmx/d"
        ALU_R[].XOR.LC  "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,BMX/LC,ALU/XOR"
        ALU_R[]-K[]     "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/A-B"
        ALU_R[]+K[]     "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,KMX/@2,BMX/KMX,ALU/A+B"
        ALU_SC          "KMX/SC,BMX/KMX,ALU/B"
        BLEG_D          "BMX/RBMX,RBMX/D"
        BLEG_LB         "BMX/LB"
        BLEG_LC         "BMX/LC"
        BLEG_Q          "BMX/RBMX,RBMX/Q"
        CPSYNC             "ACF/SYNC"
        DELAY              "CALL[DELAY]"
        D_0-K[]            "AMX/RAMX.0XT,KMX/@1,BMX/KMX,ALU/A-B,D_ALU"
        D_ACC              "DK/ACCEL"
        D_D-LB             "RAMX/D,AMX/RAMX,BMX/LB,ALU/A-B,D_ALU"
        D_D[]RC[]          "ALU_D[@1]RC[@2],D_ALU"
        D_D.AND.R[]        "RBMX/D,BMX/RBMX,SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/AND,D_ALU"
        D_D.ANDNOT.MASK    "RAMX/D,AMX/RAMX,BMX/MASK,ALU/ANDNOT,D_ALU"
        D_D.LEFT.Q         "DK/LEFT,SI/DIV"
        D_D.OR.R[]         "RBMX/D,BMX/RBMX,SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/OR,D_ALU"
        D_D.SXT[]+K[]      "RAMX/D,AMX/RAMX.SXT,DT/@1,KMX/@2,BMX/KMX,ALU/A+B,D_ALU"
        D_D.XOR.RC[]       "RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@1,BMX/LC,ALU7XOR,D_ALU"
        d_k[].left         "dk/shf,shf/left,alu_k[@1]"
        d_k[].left2        "dk/shf,shf/alu.dt,alu_k[@1],dt/long"
        d_k[].left3        "dk/shf,shf/left3,alu_k[@1]"
        D_LA+D             "AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B,D_ALU"
        D_LA.OR.D          "AMX/LA,RBMX/D,BMX/RBMX,ALU/OR,D_ALU"
        D_MASK             "BMX/MASK,ALU/B,D_ALU"
        D_MASK+1           "AMX/RAMX.0XT,BMX7MASK,ALU/A+B+1,D_ALU"
        D_NOT.RC[]         "AMX/RAMX.0XT,SPO.R/LOAD.LC,SPO.RC7@1,BMX/LC,ALU/ORNOT,D_ALU"
        D_Q.OR.D           "RAMX/Q,AMX/RAMX,ALU/OR,SHF/ALU,DK/SHF,BMX/RBMX,RBMX/D"
        D_MD               "DK/NOP"
        d_q.ornot.d        "d_alu,alu/ornot,amx/ramx,ramx/q,bmx/rbmx,rbmx/d"
        d_r[].and.d        "d_alu,alu/and,amx/la,lab_r[@1],bmx/rbmx,rbmx/d"
        D_R[].LEFT         "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/A,SHF/LEFT,DK/SHF"
        D_R[].OR.D         "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,RBMX/D,BMX/RBMX,ALU/OR,D_ALU"
        d_r[].or.k[]       "d_alu,alu_r[@1].or.k[@2]"
        D_R[].ORNOT.MASK   "SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,BMX/MASK,ALU/ORNOT,D_ALU"
        D_SC               "KMX/SC,BMX/KMX,ALU/B,SHF/ALU,DK/SHF"
        EALU_STATE-K[]     "EBMX/KMX,KMX/@1,MSC/LOAD.STATE,EALU/A-B"
        EBMX_K[]           "KMX/@1,EBMX/KMX"
        ENDOVR             "SUB/CALL,J/SCOPE"
        ERLOOP             "SUB/CALL,J/ERLOOP"
        ERROR1             "SUB/CALL,J/ERROR1"
        ERROR2             "SUB/CALL,J/ERROR2"
        force.err.r[]      "d_k[@1],q_0,call[force_err_r]"
        LAB_R(PRN)         "SPO.AC/LOAD.LAB,SPO.ACN/PRN"
        LAB_R(PRN+1)       "SPO.AC/LOAD.LAB,SPO.ACN/PRN+1"
        LAB_R(SP1+1)       "SPO.AC/LOAD.LAB,SPO.ACN/SP1+1"
        LAB_R(SRC!1)       "SPO.AC/LOAD.LAB,SPO.ACN11/SRC.OR.1"
        LAB_R(SP2)         "SPO.AC/LOAD.LAB,SPO.ACN/SP2.SP2"
        LAB_R(SP2.SP1)     "SPO.AC/LOAD.LAB,SPO.ACN/SP2.SP1"
        NEWTST             "SUB/CALL,J/SCOPE"
        NEWTST[]           "NEWTST,RC[OF]_K[@1]"
        NOP                "DK/NOP"
        Q_ACC              "QK/ACCEL"
        q_d.and.q          "q_alu,alu_d[and]q"
        Q_D[]Q             "RAMX/D,AMX/RAMX,BMX/RBMX,RBMX/Q,ALU/@1,Q_ALU"
        Q_D[]RC[]          "RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@2,BMX/LC,ALU/@1,Q_ALU"
        q_k[].left         "qk/shf,shf/left,alu_k[@1]"
        q_k[].left2        "qk/shf,shf/alu.dt,alu_k[@1],dt/long"
        q_k[].left3        "qk/shf,shf/left3,alu_k[@1]"
        Q_K(SP1)           "KMX/SP1.CON,BMX/KMX,ALU/B,Q_ALU"
        Q_MASK+1           "AMX/RAMX.0XT,BMX/MASK,ALU/A+B+1,Q_ALU"
        Q_NOT.MASK         "AMX/RAMX.0XT,BMX/MASK,ALU/ORNOT,Q_ALU"
        Q_Q.AND.LC         "RAMX/Q,AMX/RAMX,BMX/LC,ALU/AND,Q_ALU"
        Q_Q.AND.MASK       "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/AND,Q_ALU"
        Q_Q.AND.R[]        "RBMX/Q,BMX/RBMX,SPO.R/LOAD.LAB,SPO.RAB/@1,AMX/LA,ALU/AND,Q_ALU"
        Q_Q.LEFT2          "QK/LEFT2"
        q_q.or.rc[]        "q_alu,alu/or,amx/ramx,ramx/q,bmx/lc,lc_rc[@1]"
        Q_Q.XOR.D          "RAMX/Q,AMX/RAMX,RBMX/D,BMX/RBMX,ALU/XOR,D_ALU"
        Q_Q.XOR.R[]        "QK/SHF,AMX/RAMX,RAMX/Q,BMX/LB,ALU/XOR,LAB_R[@1]"
        q_r[].xor.d        "q_alu,alu_r[@1].xor.d"
        r[]_la.and.d       "amx/la,rbmx/d,bmx/rbmx,alu/and,shf/alu,spo.r/write.rab,spo.rab/@1"
        r[]_alu.left2      "shf/alu.dt,dt/long,spo.r/write.rab,spo.rab/@1"
        r[]_alu.left3      "shf/left3,spo.r/write.rab,spo.rab/@1"
        r[]_d+lc           "r[@1]_alu,alu_d+lc"
        r[]_not.k[]        "r[@1]_alu,alu_not.k[@2]"
        RC[]_0-K[]         "AMX/RAMX.0XT,KMX/@2,BMX/KMX,ALU/A-B,RC[@1]_ALU"
        RC[]_D+Q           "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/A+B,RC[@1]_ALU"
        RC[]_D.AND.LA      "RBMX/D,BMX/RBMX,AMX/LA,ALU/AND,RC[@1]_ALU"
        rc[]_d.and.lc      "rc[@1]_alu,alu/and,amx/ramx,ramx/d,bmx/lc"
        rc[]_d.and.q       "rc[@1]_alu,alu_d.and.q"
        rc[]_d.andnot.k[]  "rc[@1]_alu,alu_d[andnot]k[@2]"
        RC[]_D.ORNOT.MASK  "ALU_D.ORNOT.MASK,RC[@1]_ALU"
        rc[]_d.xor.k[]     "rc[@1]_alu,alu_d[xor]k[@2]"
        RC[]_D.XOR.LAB     "ALEG_D,BLEG_LB,ALU/XOR,RC[@1]_ALU"
        RC[]_D.XOR.LC      "ALEG_D,BLEG_LC,ALU/XOR,RC[@1]_ALU"
        RC[]_D+MASK+1      "RAMX7D,AMX/RAMX,BMX/MASK,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
        RC[]_LA+D          "AMX/LA,RBMX/D,BMX/RBMX,ALU/A+B,RC[@1]_ALU"
        RC[]_LAB.XOR.LC    "ALEG_LA,BLEG_LC,ALU/XOR,RC[@1]_ALU"
        RC[]_MASK          "ALU_MASK,RC[@1]_ALU"
        RC[]_NOT.0         "AMX7RAMX.0XT,DT7LONG,ALU/NOTA,RC[@1]_ALU"
        RC[]_NOT.D         "ALU_NOT.D,RC[@1]_ALU"
        rc[]_not.k[]       "rc[@1]_alu,alu_not.k[@2]"
        RC[]_NOT.MASK      "BMX/MASK,AMX/RAMX.0XT,DT/LONG,ALU/ORNOT,RC[@1]_ALU"
        RC[]_Q+LC          "RAMX/Q,AMX/RAMX,BMX/LC,ALU/A+B,RC[@1]_ALU"
        RC[]_Q.AND.LA      "RBMX/Q,BMX/RBMX,AMX/LA,ALU/AND,RC[@1]_ALU"
        RC[]_Q.OR.SC       "RAMX/Q,AMX/RAMX,KMX/SC,BMX/KMX,ALU/OR,RC[@1]_ALU"
        RC[]_Q+MASK        "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/A+B,RC[@1]_ALU"
        RC[]_Q+MASK+1      "RAMX/Q,AMX/RAMX,BMX/MASK,ALU/A+B+1,SHF/ALU,SPO.R/WRITE.RC,SPO.RC/@1"
        RC[]_Q.XOR.LAB     "ALEG_Q,BLEG_LB,ALU/XOR,RC[@1]_ALU"
        RC[]_Q.XOR.LC      "ALEG_Q,BLEG_LC,ALU/XOR,RC[@1]_ALU"
        RC[]_SC            "ALU_SC,RC[@1]_ALU"
        RC[]_SHF           "SPO.R/WRITE.RC,SPO.RC/@1"
        R[]_ALU.RIGHT2     "SHF/RIGHT2,SPO.R/WRITE.RAB,SPO.RAB/@1"
        R[]_D.AND.Q        "RAMX/D,AMX/RAMX,BMX/RBMX,ALU/AND,SPO.R/WRITE.RAB,SPO.RAB/@1"
        R[]_D.AND.RC[]     "RAMX/D,AMX/RAMX,SPO.R/LOAD.LC,SPO.RC/@2,BMX/LC,ALU/AND,R[@1]_ALU"
        R[]_D.ANDNOT.MASK  "RAMX/D,AMX/RAMX,BMX/MASK,ALU/ANDNOT,R[@1]_ALU"
        R[]_D.ANDNOT.Q     "RAMX/D,AMX/RAMX,RBMX/Q,BMX/RBMX,ALU/ANDNOT,R[@1]_ALU"
        R[]_D.LEFT         "RAMX/D,AMX/RAMX,ALU/A,SHF/LEFT,SPO.RAB/@1,SPO.R/WRITE.RAB"
        R[]_D.OR.K[]       "RAMX/D,AMX/RAMX,KMX/@2,BMX/KMX,ALU/OR,R[@1]_ALU"
        R[]_D.ORNOT.MASK   "RAMX/D,AMX/RAMX,BMX/MASK,ALU/ORNOT,R[@1]_ALU"
        R[]_D.XOR.LAB      "ALEG_D,BLEG_LB,ALU/XOR,R[@1]_ALU"
        R[]_D.XOR.LC       "ALEG_D,BLEG_LC,ALU/XOR,R[@1]_ALU"
        R[]_LA.OR.K[]      "R[@1]_ALU,AMX/LA,BMX/KMX,KMX7@2,ALU/OR"
        R[]_LAB.XOR.LC     "ALEG_LA,BLEG_LC,ALU/XOR,R[@1]_ALU"
        R[]_NOT.LA         "AMX/LA,ALU/NOTA,SPO.R/WRITE.RAB,SPO.RAB/@1"
        R[]_Q.XOR.LAB      "ALEG_Q,BLEG_LB,ALU/XOR,R[@1]_ALU"
        R[]_Q.XOR.LC       "ALEG_Q,BLEG_LC,ALU/XOR,R[@1]_ALU"
        R[]_SHF            "SPO.R/WRITE.RAB,SPO.RAB/@1"
        RETURN4            "SUB/RET,J/4"
        sc_0-k[]-1         "sc_alu,alu/a-b-1,bmx/kmx,kmx/@1,amx/ramx.0xt"
        sc_k[]+1           "sc_alu,alu/a+b+1,amx/ramx.0xt,bmx/kmx,kmx/@1"
        SC_SC-1            "KMX/.1,EBMX/KMX,EALU/A-B,SMX/EALU,SCK/LOAD"
        set.diag.mode[]    "d_k[@1],call[set_diag_mode]"
        set.ecc[]           "d_k[@1],call[set_ecc]"
        set.trap.mask[] "sc_k[@1],call[set_trap_mask]"
        SETMCR[]            "R[0A]_K[@1],CALL,J/SETMCR"
        SETRCF[]            "SC_K[@1],CALL,J/SETRCF"
        SETRXCS[]           "R[0A]_K[@1],CALL,J/SETRXCS"
        SETTXCS[]           "R[0A]_K[@1],CALL,J/SETTXCS"
        SUBTEST             "CALL,J/SUBTST"
        TRAP.FPA            "ACF/CONTROL,ACM/7"
        TYPE_MSG_1          "D_K[.1],CALL[MSGCOM]"
        TYPE_MSG_2          "D_K[.2],CALL[MSGCOM]"
        TYPE_MSG_3          "D_K[.3],CALL[MSGCOM]"
        TYPE_MSG_4          "D_K[.4],CALL[MSGCOM]"
        TYPE_MSG_5          "CALL[MSGCOM],D_ALU.LEFT,SI/7,ALU_K[.2]"
        TYPE_MSG_6          "D_K[.6],CALL[MSGCOM]"
        TYPE_MSG_7          "D_K[.7],CALL[MSGCOM]"
        TYPE_MSG_8          "D_K[.8],CALL[MSGCOM]"
        TYPE_MSG_9          "D_K[.9],CALL[MSGCOM]"
        TYPE_MSG_A          "D_K[.A],CALL[MSGCOM]"
        TYPE_MSG_B          "CALL[MSGCOM],D_ALU.LEFT,SI/7,ALU_0+K[.4]+1"
        TYPE_MSG_C          "CALL[MSGCOM],D_K[.C]"
        TYPE_MSG_D          "CALL[MSGCOM],D_K[.D]"
        TYPE_MSG_E          "CALL[MSGCOM],D_ALU.LEFT,SI/ZERO,ALU_K[.7]"
        TYPE_MSG_F          "CALL[MSGCOM],D_K[.F]"
        TYPE_RC[0E]         "CALL[RCECOM]"
        TYP_MSG_1_CRLF      "D_K[.1],CALL[MSGCOM_CRLF]"
        TYP_MSG_2_CRLF      "D_K[.2],CALL[MSGCOM_CRLF]"
        TYP_MSG_3_CRLF      "D_K[.3],CALL[MSGCOM_CRLF]"
        TYP_MSG_4_CRLF      "D_K[.4],CALL[MSGCOM_CRLF]"
        TYP_MSG_5_CRLF      "CALL[MSGCOM_CRLF],D_ALU.LEFT,SI/7,ALU_K[.2]"
        TYP_MSG_6_CRLF      "D_K[.6],CALL[MSGCOM_CRLF]"
        TYP_MSG_7_CRLF      "D_K[.7],CALL[MSGCOM_CRLF]"
        TYP_MSG_8_CRLF      "D_K[.8],CALL[MSGCOM_CRLF]"
        TYP_MSG_9_CRLF      "D_K[.9],CALL[MSGCOM_CRLF]"
        TYP_MSG_A_CRLF      "D_K[.A],CALL[MSGCOM_CRLF]"
        TYP_MSG_B_CRLF      "CALL[MSGCOM_CRLF],D_ALU.LEFT,SI/7,ALU_0+K[.4]+1"
        TYP_MSG_C_CRLF      "CALL[MSGCOM_CRLF],D_K[.C]"
        TYP_MSG_D_CRLF      "CALL[MSGCOM_CRLF],D_K[.D]"
        TYP_MSG_E_CRLF      "CALL[MSGCOM_CRLF],D_ALU.LEFT,SI/ZERO,ALU_K[.7]"
        TYP_MSG_F_CRLF      "CALL[MSGCOM_CRLF],D_K[.F]"
        TYP_MSG_10_CRLF "CALL[MSGCOM_CRLF],D_K[.10]"
        TYP_MSG_11_CRLF "CALL[MSGCOM_CRLF],D_ALU,ALU_0+K[.10]+1"
        TYP_RC[0E]_CRLF "CALL[RCECOM_CRLF]"
        VA_D.0XT[]          "ALU_D.0XT[@1],VA_ALU"
        VA_D.0XT[]+K[]  "ALU_D.0XT[@1]+K[@2],VA_ALU"
        VA_R[]+K[]          "SPO.R/LOAD.LAB,SPO.RAB7@1,KMX/@2,BMX/KMX,AMX/LA,ALU/A+B,VA_ALU"

; BRANCH DEFINITIONS
        ALU.Z?              "BEN/ALU"        ; NOTE J/XXB NESSECARY
        ALU.C?              "BEN/ALU"
        D1-0?               "BEN/D3-0"
.LIST
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 1807  MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2099  TEST 40 MISCELLANEOUS D REGISTER FUNCTIONS TEST
; 2278  TEST 41 D SHIFT LEFT TEST
; 2325  TEST 42 D SHIFT RIGHT TEST
; 2373  TEST 43 BEN/D3-0 TEST
; 2516  TEST 44 BEN/D.NE.0 TEST
; 2607  TEST 45 MISCELLANEOUS Q REGISTER FUNCTIONS TEST
; 2829  TEST 46 LEFT SHIFT Q REGISTER TEST
; 2908  TEST 47 RIGHT SHIFT Q REGISTER TEST
; 2984  TEST 48 FLOAT 1 THROUGH 0'S IN RA AND RB REGISTERS TEST
; 3042  TEST 49 FLOAT 0 THROUGH 1'S IN RA AND RB REGISTERS TEST
; 3104  TEST 4A RA AND RB REGISTERS FOREWARD DUAL ADDRESSING TEST
; 3205  TEST 4B RA AND RB REGISTERS BACKWARD DUAL ADDRESSING TEST
; 3310  TEST 4C GALLOP 1'S IN RA AND RB REGISTERS TEST
; 3412  TEST 4D GALLOP 0'S IN RA AND RB REGISTERS TEST
```

```
;1        .NOLIST
;1804     .LIST
;1805
```

```
                                                  .TITLE  "ESKAH20 -- VAX 11/780 MICRO DIAGNOSTICS MODULE 20"
                                                  .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                          .REGION/1000,13FF
                                          ;+
                                          ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                          ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                          ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                          ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                          ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                          ;
                                          ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                          ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                          ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                          ;       R[OF] AND DO A RETURN0.
                                          ;
                                          ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                          ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                          ; TO THE CONSOLE.
                                          ;
                                          ;-
U 1100, 0000,003C,1980,0800,0084,7003     1100:   SC_K[ZERO],J/TRPH1          ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001     1101:   SC_K[.1],J/TRPH0            ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001     1102:   SC_K[.2],J/TRPH0            ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001     1103:   SC_K[.3],J/TRPH0            ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001     1104:   SC_K[.4],J/TRPH0            ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001     1105:   SC_K[.6],J/TRPH0            ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001     1106:   SC_K[.9],J/TRPH0            ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001     1107:   SC_K[.7],J/TRPH0            ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001     1108:   SC_K[.8],J/TRPH0            ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003     110C:   SC_K[.C],J/TRPH1            ; RDS
U 110D, 0000,003C,8980,0800,0084,7003     110D:   SC_K[.D],J/TRPH1            ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001     110E:   SC_K[.10],J/TRPH0           ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003     110F:   SC_K[.F],J/TRPH1            ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,1006     TRPH0:  Q_ID[USTACK]
U 1006, 0C00,003C,01E0,0800,0000,100B             Q_D,D_Q
U 100B, 0000,003C,8180,3C00,0000,100E             ID[USTACK]_D
U 100E, 0C00,003C,01E0,0800,0000,1043             Q_D,D_Q
U 1043, 0000,003C,01C0,0A78,0000,1046             Q_R[OF]
U 1046, 0001,2024,0180,0800,0010,104B             A[U_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 104B, 0000,013C,0180,0800,0000,1002             Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000     =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
                                          ;+
                                          ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                          ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                          ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                          ;
                                          ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                          ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                          ;             FAULT STATUS REGISTER
                                          ;             SBI ERROR REGISTER
                                          ;             TIMEOUT ADDRESS REGISTER
                                          ;             MAINTENANCE REGISTER
                                          ;             CACHE PARITY REGISTER
                                          ;             TB ERROR REGISTER 1
                                          ;             TB ERROR REGISTER 0
```

```
                                            ;1861     ;-
U 1003, 0018,0038,1D80,09E8,0000,1004       ;1862     TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,713C       ;1863     =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,1053       ;1864             Q_ID[TBER0]
U 1053, 0001,203C,4DF0,2DB0,0000,1054       ;1865             RC[6]_Q,Q_ID[TBER1]
U 1054, 0001,203C,65F0,2DB8,0000,1056       ;1866             RC[7]_Q,Q_ID[SBI.ERR]
U 1056, 0001,203C,6DF0,2DD8,0000,105B       ;1867             RC[0B]_Q,Q_ID[FAULT]
U 105B, 0001,203C,75F0,2DE0,0000,105C       ;1868             RC[0C]_Q,Q_ID[MAINT]
U 105C, 0001,203C,79F0,2DC8,0000,1073       ;1869             RC[9]_Q,Q_ID[PARITY]
U 1073, 0001,203C,69F0,2DC0,0000,10CC       ;1870             RC[8]_Q,Q_ID[TIME.ADDR]
U 10CC, 0001,203C,81F0,2DD0,0000,1000       ;1871             RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1124       ;1872     1000:   RC[0E]_Q,ERROR1
                                            ;1873     ;+
                                            ;1874     ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                            ;1875     ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                            ;1876     ;               NEWTST
                                            ;1877     ;               ERLOOP
                                            ;1878     ;               ERROR1
                                            ;1879     ;               ERROR2
                                            ;1880     ;
U 10CE, 0000,003C,65F8,0800,0084,70D4       ;1881     SCOPE:  SC_K[.10],Q_0                 ; SETUP TO WRITE IPL OF 1F
U 10D4, 0818,0038,8D80,0800,0000,10D6       ;1882             D_K[.1F]                      ; ...
U 10D6, 0D00,003C,0180,0800,0000,10DC       ;1883             D_DAL.SC
U 10DC, 0000,003C,3D80,3C00,0000,10DE       ;1884             ID[PSL]_D                     ; WRITE THE PSL
U 10DE, 0818,0038,0580,0800,0000,10E4       ;1885             D_K[.1]                       ; SETUP TO CLEAR THE CES REGISTER
U 10E4, 0D00,003C,0180,0800,0000,10E6       ;1886             D_DAL.SC
U 10E6, 0F00,003C,3180,3C00,0000,10EC       ;1887             ID[CES]_D,D_0                 ; CLEAR THE CES REGISTER
U 10EC, 0000,003C,5D80,3C00,0000,10EE       ;1888             ID[ACC.CS]_D                  ; SHUT OFF THE FLOATING POINT
U 10EE, 0000,003C,3980,3C00,0000,10F4       ;1889             ID[SIR]_D                     ; CLEAR THE SIR REGISTER
U 10F4, 0000,003C,2980,3C00,0000,10F6       ;1890             ID[CLK.CS]_D                  ; STOP INTERVAL TIMER
U 10F6, 0000,003C,4980,3C00,0000,10FC       ;1891             ID[TBER0]_D                   ; SHUT OFF THE TB
U 10FC, 0818,0038,C180,0800,0000,10FE       ;1892             D_K[.FFFF]
U 10FE, 0000,003C,6580,3C00,0000,1109       ;1893             ID[SBI.ERR]_D
U 1109, 0F00,003C,6D80,3C00,0000,1114       ;1894             ID[FAULT]_D,D_0
U 1114, 0000,003C,6D80,3C00,0000,1116       ;1895             ID[FAULT]_D
U 1116, 0000,003C,6580,3C00,0000,111C       ;1896             ID[SBI.ERR]_D
U 111C, 0003,003C,0180,0AF8,0000,105E       ;1897             R[0F]_0,J/CALLCON             ; CALL THE CONSOLE
U 111E, 0818,0038,0980,0800,0000,105E       ;1898     ERLOOP: D_K[.2],J/CALLCON             ; ERRLOOP CALL
U 1124, 0810,0038,0180,0978,0000,1126       ;1899     ERROR1: D_RC[0F]
U 1126, 0819,0034,4D80,0800,0000,104E       ;1900             D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E       ;1901     104E:   D_D.OR.K[.4],J/CALLCON
U 112C, 0810,0038,0180,0978,0000,112E       ;1902     ERROR2: D_RC[0F]
U 112E, 0819,0034,4D80,0800,0000,105A       ;1903             D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E       ;1904     105A:   D_D.OR.K[.6],J/CALLCON
                                            ;1905     105E:
                                            ;1906     CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E       ;1907             ID[TXDB]_D,J/CALLCON          ; CALL THE CONSOLE
                                            ;1908     ;+
                                            ;1909     ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                            ;1910     ;-
U 13F0, 0000,003C,0180,0800,0000,13F1       ;1911     13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2       ;1912     13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3       ;1913     13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4       ;1914     13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5       ;1915     13F4:   NOP
```

```
U 13F5, 0000,003C,0180,0800,0000,13F6     ;1916   13F5:    NOP
U 13F6, 0000,003C,0180,0800,0000,13F7     ;1917   13F6:    NOP
U 13F7, 0000,003C,0180,0800,0000,13F8     ;1918   13F7:    NOP
U 13F8, 0000,003C,0180,0800,0000,13F9     ;1919   13F8:    NOP
U 13F9, 0000,003C,0180,0800,0000,13FA     ;1920   13F9:    NOP
U 13FA, 0000,003C,0180,0800,0000,13FB     ;1921   13FA:    NOP
U 13FB, 0000,003C,0180,0800,0000,13FC     ;1922   13FB:    NOP
U 13FC, 0000,003C,0180,0800,0000,13FD     ;1923   13FC:    NOP
U 13FD, 0000,003C,0180,0800,0000,13FE     ;1924   13FD:    NOP
U 13FE, 0000,003C,0180,0800,0000,13FF     ;1925   13FE:    NOP
U 13FF, 0000,003C,0180,0800,0000,1155     ;1926   13FF:    NOP
U 1155, 0000,003C,0180,0800,0000,12AA     ;1927   1155:    NOP
U 12AA, 0000,003C,0180,0800,0000,1134     ;1928   12AA:    NOP
                                          ;1929   ;+
                                          ;1930   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                          ;1931   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                          ;1932   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                          ;1933   ; TYPING IT.
                                          ;1934   ;-
U 1134, 0810,0038,4D80,0978,0000,1136     ;1935   SUBTST: D_RC[OF],KMX/.FF00
U 1136, 0019,4016,4D80,09F8,0000,0001     ;1936            RC[OF]_D+K[.FF00],WORD,RETURN1
                                          ;1937   ;+
                                          ;1938   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                          ;1939   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                          ;1940   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                          ;1941   ;-
U 113C, 0010,0038,01C0,0978,0000,113E     ;1942   SETRCF: Q_RC[OF]
U 113E, 0019,2034,4DC0,0800,0000,1144     ;1943            Q_Q.AND.K[.FF00]
U 1144, 0019,2032,1D80,09F8,0000,0001     ;1944            RC[OF]_Q.OR.SC,RETURN1
                                          ;1945
                                          ;1946   ;+
                                          ;1947   ; THIS ROUTINE IS USED TO DECREMENT THE TYPEOUT FLAG
                                          ;1948   ;-
U 1146, 0000,003C,C1F0,2C00,0000,114C     ;1949   DECFLG: Q_ID[TO]
U 114C, 0819,2000,0580,0800,0000,114E     ;1950            D_Q-K[.1]
U 114E, 0000,003E,C180,3C00,0000,0001     ;1951            ID[TO]_D,RETURN1
                                          ;1952
                                          ;1953   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 1152, 0118,0038,1B80,0800,0000,115E     ;1954   S00:     ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 1154, 0118,0038,0B80,0800,0000,115E     ;1955   S01:     ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1156, 0118,0038,0780,0800,0000,115E     ;1956   S10:     ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 115C, 0118,0038,C380,0800,0000,115E     ;1957   S11:     ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
                                          ;1958   =0000
U 1010, 0018,0038,1980,0800,0000,1152     ;1959   DC0:     ALU_0(K),J/S00
U 1011, 0018,0038,1980,0800,0000,1154     ;1960   DC1:     ALU_0(K),J/S01
U 1012, 0018,0038,1980,0800,0000,1156     ;1961   DC2:     ALU_0(K),J/S10
U 1013, 0018,0038,1980,0800,0000,115C     ;1962   DC3:     ALU_0(K),J/S11
U 1014, 0018,0038,0980,0800,0000,1152     ;1963   DC4:     ALU_K[.2],J/S00
U 1015, 0018,0038,0980,0800,0000,1154     ;1964   DC5:     ALU_K[.2],J/S01
U 1016, 0018,0038,0980,0800,0000,1156     ;1965   DC6:     ALU_K[.2],J/S10
U 1017, 0018,0038,0980,0800,0000,115C     ;1966   DC7:     ALU_K[.2],J/S11
U 1018, 0018,0038,0580,0800,0000,1152     ;1967   DC8:     ALU_K[.1],J/S00
U 1019, 0018,0038,0580,0800,0000,1154     ;1968   DC9:     ALU_K[.1],J/S01
U 101A, 0018,0038,0580,0800,0000,1156     ;1969   DCA:     ALU_K[.1],J/S10
U 101B, 0018,0038,0580,0800,0000,115C     ;1970   DCB:     ALU_K[.1],J/S11
```

```
U 101C, 0018,0038,C180,0800,0000,1152    ;1971    DCC:     ALU_K[.FFFF],J/S00
U 101D, 0018,0038,C180,0800,0000,1154    ;1972    DCD:     ALU_K[.FFFF],J/S01
U 101E, 0018,0038,C180,0800,0000,1156    ;1973    DCE:     ALU_K[.FFFF],J/S10
U 101F, 0018,0038,C180,0800,0000,115C    ;1974    DCF:     ALU_K[.FFFF],J/S11
U 115E, 0100,003E,0380,0800,0000,0001    ;1975    SX:      D_D.LEFT2,SI/7,RETURN1
U 1164, 0018,0038,0580,0800,0000,1166    ;1976    DCAAAA: ALU_K[.1]
U 1166, 0118,0038,0780,0800,0000,116C    ;1977             ALU_K[.1],D_D.LEFT2,SI/7
U 116C, 0118,0038,0780,0800,0000,116E    ;1978             ALU_K[.1],D_D.LEFT2,SI/7
U 116E, 0118,0038,0780,0800,0000,1174    ;1979             ALU_K[.1],D_D.LEFT2,SI/7
U 1174, 0118,0038,0780,0800,0000,1176    ;1980             ALU_K[.1],D_D.LEFT2,SI/7
U 1176, 0118,0038,0780,0800,0000,117C    ;1981             ALU_K[.1],D_D.LEFT2,SI/7
U 117C, 0118,0038,0780,0800,0000,117E    ;1982             ALU_K[.1],D_D.LEFT2,SI/7
U 117E, 0118,0038,0780,0800,0000,1184    ;1983             ALU_K[.1],D_D.LEFT2,SI/7
U 1184, 0100,003E,0380,0800,0000,0001    ;1984             D_D.LEFT2,SI/7,RETURN1
U 1186, 0018,0038,0980,0800,0000,118C    ;1985    DRAAAA: ALU_K[.2]
U 118C, 0218,0038,0B80,0800,0000,118E    ;1986             ALU_K[.2],D_D.RIGHT2,SI/7
U 118E, 0218,0038,0B80,0800,0000,1194    ;1987             ALU_K[.2],D_D.RIGHT2,SI/7
U 1194, 0218,0038,0B80,0800,0000,1196    ;1988             ALU_K[.2],D_D.RIGHT2,SI/7
U 1196, 0218,0038,0B80,0800,0000,119C    ;1989             ALU_K[.2],D_D.RIGHT2,SI/7
U 119C, 0218,0038,0B80,0800,0000,119E    ;1990             ALU_K[.2],D_D.RIGHT2,SI/7
U 119E, 0218,0038,0B80,0800,0000,11A2    ;1991             ALU_K[.2],D_D.RIGHT2,SI/7
U 11A2, 0218,0038,0B80,0800,0000,11A4    ;1992             ALU_K[.2],D_D.RIGHT2,SI/7
U 11A4, 0200,003E,0380,0800,0000,0001    ;1993             D_D.RIGHT2,SI/7,RETURN1
U 11A6, 0F00,003C,0180,0800,0000,11AC    ;1994    DC.NF:   D_0
U 11AC, 0819,0000,0580,0800,0000,1010    ;1995             D_D-K[.1],J/DC0
                                         ;1996    ; THIS TABLE IS ISED AS A TARGET TO TEST  BRANCHES.
                                         ;1997    ; NOTE THAT IT RETURNS BY RETURN2 IF Q IS
                                         ;1998    ; ZERO AFTER EXECUTION, OR RETURNS BY RETURN1 IF Q IS NON ZERO.
                                         ;1999    =0000
U 1020, 0019,2000,05C0,0800,0000,1021    ;2000    BRTBLE: Q_Q-K[.1]
U 1021, 0019,2000,05C0,0800,0000,1022    ;2001             Q_Q-K[.1]
U 1022, 0019,2000,05C0,0800,0000,1023    ;2002             Q_Q-K[.1]
U 1023, 0019,2000,05C0,0800,0000,1024    ;2003             Q_Q-K[.1]
U 1024, 0019,2000,05C0,0800,0000,1025    ;2004             Q_Q-K[.1]
U 1025, 0019,2000,05C0,0800,0000,1026    ;2005             Q_Q-K[.1]
U 1026, 0019,2000,05C0,0800,0000,1027    ;2006             Q_Q-K[.1]
U 1027, 0019,2000,05C0,0800,0000,1028    ;2007             Q_Q-K[.1]
U 1028, 0019,2000,05C0,0800,0000,1029    ;2008    BRT1:    Q_Q-K[.1]
U 1029, 0019,2000,05C0,0800,0000,102A    ;2009             Q_Q-K[.1]
U 102A, 0019,2000,05C0,0800,0000,102B    ;2010             Q_Q-K[.1]
U 102B, 0019,2000,05C0,0800,0000,102C    ;2011             Q_Q-K[.1]
U 102C, 0019,2000,05C0,0800,0000,102D    ;2012    BRT2:    Q_Q-K[.1]
U 102D, 0019,2000,05C0,0800,0000,102E    ;2013             Q_Q-K[.1]
U 102E, 0019,2000,05C0,0800,0000,102F    ;2014             Q_Q-K[.1]
U 102F, 0001,203C,0180,0800,0010,11AE    ;2015             ALU_Q,CLK.UBCC
U 11AE, 001D,2114,01C0,0800,0000,100C    ;2016             Z?,ALU_Q+D,Q_ALU
U 100C, 0000,003E,0180,0800,0000,0001    ;2017    =0       RETURN1
U 100D, 0000,003E,0180,0800,0000,0002    ;2018             RETURN2
                                         ;2019    ; THESE TABLES ARE USED TO WRITE THE RA AND RB SCRATCH PADS.
                                         ;2020    =0000
U 1030, 0001,203E,0180,0A80,0000,0001    ;2021    WRRARB: R[0]_Q,RETURN1
U 1031, 0001,203E,0180,0A88,0000,0001    ;2022             R[1]_Q,RETURN1
U 1032, 0001,203E,0180,0A90,0000,0001    ;2023             R[2]_Q,RETURN1
U 1033, 0001,203E,0180,0A98,0000,0001    ;2024             R[3]_Q,RETURN1
U 1034, 0001,203E,0180,0AA0,0000,0001    ;2025             R[4]_Q,RETURN1
```

```
U 1035, 0001,203E,0180,0AA8,0000,0001                     R[5]_Q,RETURN1
U 1036, 0001,203E,0180,0AB0,0000,0001                     R[6]_Q,RETURN1
U 1037, 0001,203E,0180,0AB8,0000,0001                     R[7]_Q,RETURN1
U 1038, 0001,203E,0180,0AC0,0000,0001                     R[8]_Q,RETURN1
U 1039, 0001,203E,0180,0AC8,0000,0001                     R[9]_Q,RETURN1
U 103A, 0001,203E,0180,0AD0,0000,0001                     R[0A]_Q,RETURN1
U 103B, 0001,203E,0180,0AD8,0000,0001                     R[0B]_Q,RETURN1
U 103C, 0001,203E,0180,0AE0,0000,0001                     R[0C]_Q,RETURN1
U 103D, 0001,203E,0180,0AE8,0000,0001                     R[0D]_Q,RETURN1
U 103E, 0001,203E,0180,0AF0,0000,0001                     R[0E]_Q,RETURN1
U 103F, 0001,203E,0180,0AF8,0000,0001                     R[0F]_Q,RETURN1
                                             ; THESE ARE USED TO READ THE RA AND RB SCRATCH PADS
                                             ; INTO LA AND LB.
                                             =0000
U 1060, 0000,003E,0180,0A00,0000,0001        LTCHAB: LAB_R[0],RETURN1
U 1061, 0000,003E,0180,0A08,0000,0001                LAB_R[1],RETURN1
U 1062, 0000,003E,0180,0A10,0000,0001                LAB_R[2],RETURN1
U 1063, 0000,003E,0180,0A18,0000,0001                LAB_R[3],RETURN1
U 1064, 0000,003E,0180,0A20,0000,0001                LAB_R[4],RETURN1
U 1065, 0000,003E,0180,0A28,0000,0001                LAB_R[5],RETURN1
U 1066, 0000,003E,0180,0A30,0000,0001                LAB_R[6],RETURN1
U 1067, 0000,003E,0180,0A38,0000,0001                LAB_R[7],RETURN1
U 1068, 0000,003E,0180,0A40,0000,0001                LAB_R[8],RETURN1
U 1069, 0000,003E,0180,0A48,0000,0001                LAB_R[9],RETURN1
U 106A, 0000,003E,0180,0A50,0000,0001                LAB_R[0A],RETURN1
U 106B, 0000,003E,0180,0A58,0000,0001                LAB_R[0B],RETURN1
U 106C, 0000,003E,0180,0A60,0000,0001                LAB_R[0C],RETURN1
U 106D, 0000,003E,0180,0A68,0000,0001                LAB_R[0D],RETURN1
U 106E, 0000,003E,0180,0A70,0000,0001                LAB_R[0E],RETURN1
U 106F, 0000,003E,0180,0A78,0000,0001                LAB_R[0F],RETURN1
                                             ; THIS ROUTINE IS USED TO FILL ALL RA AND RB WITH THE
                                             ; CONTENTS OF Q.
                                             =0
U 1044, 0F00,003D,0180,0800,0000,11A6        RARB.Q: D_0,CALL,J/DC.NF
U 1045, 0000,003C,0180,0800,0000,104C                NOP
                                             =0
U 104C, 0000,193D,0180,0800,0000,1030        RARB.QA:        CALL,D3-0?,J/WRRARB
U 104D, 0819,0014,0580,0800,0010,11B4                D_D+K[.1],CLK.UBCC
U 11B4, 0000,013C,0180,0800,0000,1058                Z?
U 1058, 0000,003C,0180,0800,0000,104C        =0      J/RARB.QA
U 1059, 0000,003E,0180,0800,0000,0001                RETURN1
                                             ;******************************************************************
                                             ;+
                                             ;       THIS ROUTINE CHECKS ID[TO] (THE TYPE OUT FLAG).
                                             ;       IF ID[TO] IS NEGATIVE, THE MESSAGE IS TYPED, AND ID[TO]
                                             ;       IS INCREMENTED.  THIS IS THE COMMUNICATION DEVICE BETWEEN
                                             ;       ESKAE (THE MICRO TEST MONITOR), AND THE GO CHAIN OVERLAYS
                                             ;       TO TELL WHETHER LOOP ON TEST OR SECTION HAS BEEN SPECIFIED.
                                             ;
                                             ;       MSGCOM: IS USED BY A MACRO CALL ''TYP[E]_MSG_X[_CRLF] WHERE D STILL
                                             ;               NEEDS TO BE SHIFTED 9 PLACES.
                                             ;       CNFCOM: IS USED BY THE SUBROUTINE ''CONFIG'' WHERE D DOES
                                             ;               NOT NEED ANY FURTHER SHIFTING.
                                             ;-
                                             ;******************************************************************
```

```
U 11B6, 0000,003C,F580,0800,0084,71BC    ;2081   MSGCOM: SC_K[.A]
                                         ;2082   MSGCOM_1:
U 11BC, 0000,003C,0180,0800,0100,11BE    ;2083           FE_SC
U 11BE, 0000,003C,D9F8,0800,0084,71C4    ;2084           SC_K[.9],Q_0
U 11C4, 0D00,003C,0180,0800,0000,11C6    ;2085           D_DAL.SC
U 11C6, 0000,003C,C1F0,2C00,0000,11CC    ;2086   CNFCOM: Q_ID[T0]
U 11CC, 0C01,203C,01E0,0800,0010,11CE    ;2087           ALU_Q,CLK.UBCC,Q_D,D_Q
U 11CE, 0819,1B14,0580,0800,0000,1007    ;2088           ALU_N?,D_D+K[.1]
U 1007, 0C00,003E,0180,0800,0000,0001    ;2089   =0111   RETURN1,D_Q
U 100F, 0C00,003C,C180,3C00,0081,11D4    ;2090           ID[T0]_D,D_Q,SC_FE
U 11D4, 0819,0030,1D80,0800,0000,105E    ;2091           D_D.OR.K[SC],J/CALLCON
                                         ;2092
                                         ;2093   RCECOM_CRLF:
U 11D6, 0000,003C,2180,0800,0084,71BC    ;2094           SC_K[.14],J/MSGCOM_1
                                         ;2095   MSGCOM_CRLF:
U 11DC, 0018,0038,65C0,0800,0000,11DE    ;2096           Q_K[.10]
U 11DE, 0019,2030,0980,0800,0082,11BC    ;2097           SC_Q.OR.K[.2],J/MSGCOM_1
                                         ;2098
```

```
                                           ;2099            .PAGE   "TEST 40       MISCELLANEOUS D REGISTER FUNCTIONS TEST"
                                           ;2100    ;*************************************************************
                                           ;2101    ;++
                                           ;2102    ; TEST  40      MISCELLANEOUS D REGISTER FUNCTIONS TEST
                                           ;2103    ;
                                           ;2104    ; TEST DESCRIPTION
                                           ;2105    ;       THIS IS A TEST OF SINGLE AND DOUBLE LEFT
                                           ;2106    ;       AND RIGHT SHIFTS IN THE D REGISTER. ALSO TESTED ARE
                                           ;2107    ;       VARIOUS SHIFT INPUTS AND BRANCH CONDITIONS.
                                           ;2108    ;
                                           ;2109    ; LOGIC DESCRIPTION
                                           ;2110    ;       TESTED HERE ARE:
                                           ;2111    ;       LOGIC                   LOCATION (MODULE NAME)
                                           ;2112    ;       UDK FIELD DECODE        DBP
                                           ;2113    ;       D REGISTER              DBP
                                           ;2114    ;       DMX                     DBP
                                           ;2115    ;       USI FIELD DECODE        DAP
                                           ;2116    ;       D REG USI MUX           DAP
                                           ;2117    ;       D REG BRANCH CONDITIONS DBP
                                           ;2118    ;       BRANCH CONDITION MUX    ICL
                                           ;2119    ;
                                           ;2120    ; ERROR DESCRIPTION
                                           ;2121    ;       D REGISTER RESULT
                                           ;2122    ;       ERROR CODE: AS GIVEN BY THE FOLLOWING TABLE
                                           ;2123    ;
                                           ;2124    ;               SUBTEST #       VALUE           MEANING
                                           ;2125    ;                  1             NOT APPLICABLE
                                           ;2126    ;                  2              0             BEN/D (D.NE.0?) FAILED
                                           ;2127    ;                                 1             BEN/D (D31?) FAILED
                                           ;2128    ;                                 2             D_D.RIGHT FAILED
                                           ;2129    ;                  3              0             D_D.LEFT *OR* BEN/D (D31? FAILED
                                           ;2130    ;                                 1             BEN/D (D0?) FAILED
                                           ;2131    ;                  4              0             BEN/D (D0?) FAILED
                                           ;2132    ;                                 1             SI/2 OR SI/4 FAILED
                                           ;2133    ;                  5             NOT APPLICABLE
                                           ;2134    ;                  6              0             SI/7 FAILED TO SHIFT IN 0
                                           ;2135    ;                                 1             SI/7 FAILED TO SHIFT IN 1
                                           ;2136    ;
                                           ;2137    ;--
                                           ;2138    ;*************************************************************
                                           ;2139    =0
U 1074, 0000,003D,0180,0800,0000,10CE      ;2140    DREG:   NEWTST
U 1075, 0018,0038,0980,09F8,0000,1078      ;2141            RC[OF]_K[.2]
                                           ;2142    ;////////////7/////////////////////////////////////////////////
                                           ;2143    ;+
                                           ;2144    ; SUBTEST       1
                                           ;2145    ; CLEAR D AND BEN D.NE.0 TEST
                                           ;2146    ;-
                                           ;2147    =0
U 1078, 0000,003D,0180,0800,0000,1134      ;2148    DPT1:   SUBTEST
U 1079, 0000,003C,0180,0800,0000,107A      ;2149            NOP
U 107A, 0000,003D,0180,0800,0000,111E      ;2150    =0      ERLOOP
U 107B, 0F1B,0000,0580,0800,0000,11E4      ;2151            D_0,ALU_0-K[.1]
U 11E4, 0001,0D3C,0180,09F0,0000,1055      ;2152            D.NE.0?,RC[0E]_D        ; TEST INSTRUCTION
                                           ;2153                                    ; BEN D#0
```

```
U 1055, 0000,003C,0180,0800,0000,107C   ;2154   =101    J/DPT2                  ; BEN.D#0 OK.
U 1057, 0018,0039,0580,09E8,0000,1124   ;2155           ERROR1,RC[OD]_K[.1]     ; BEN.D#0 FAILED OR
                                        ;2156                                   ; D_0 FAILED
                                        ;2157   ;//////////////////////////////////////////////////////////////
                                        ;2158   ;+
                                        ;2159   ; SUBTEST       2
                                        ;2160   ; D.NE.0 (DEASSERTED)
                                        ;2161   ; D31? (DEASSERTED)
                                        ;2162   ; RIGHT SHIFT D SINGLE  (UDK=6, USI=3)
                                        ;2163   ;-
                                        ;2164   =0
U 107C, 0000,003D,0180,0800,0000,1134   ;2165   DPT2:           SUBTEST
U 107D, 0003,003C,0180,09E8,0000,1080   ;2166                   RC[OD]_0                ; ERROR #0
U 1080, 0000,003D,0180,0800,0000,111E   ;2167   =0              ERLOOP
U 1081, 0818,0038,11F8,0800,0000,11E6   ;2168                   D_K[.4],Q_0
U 11E6, 0018,0038,1980,0800,0000,11EA   ;2169                   ALU_0(K)
U 11EA, 0600,003C,0180,0800,0000,11EE   ;2170                   D_D.RIGHT,SI/ZERO       ;  TEST INSTRUCTION
U 11EE, 0001,0D3C,0180,09F0,0000,105D   ;2171                   D.NE.0?,RC[OE]_D
U 105D, 0000,003D,0180,0800,0000,1124   ;2172   =101            ERROR1                  ; BEN D.NE.0 FAILED
U 105F, 0018,0038,0580,09E8,0000,12AB   ;2173                   RC[OD]_K[.1]            ; ERROR #1
U 12AB, 0000,0D3C,0180,0800,0000,1076   ;2174                   D31?                    ; DID IT SHIFT 0 IN?
U 1076, 0000,003C,0180,0800,0000,12E6   ;2175   =110            J/DPT2A                 ; MAYBE
U 1077, 0000,003D,0180,0800,0000,1124   ;2176                   ERROR1                  ; EITHER FLOATING INPUT OR
                                        ;2177                                           ; BEN D31? FAILED
U 12E6, 0019,0000,0980,0800,0010,12E7   ;2178   DPT2A:          ALU_D-K[.2],CLK.UBCC
U 12E7, 0018,0138,0980,09E8,0000,1082   ;2179                   Z?,RC[OD]_K[.2]         ; ERROR #2
U 1082, 0000,003D,0180,0800,0000,1124   ;2180   =0              ERROR1                  ; D_D.RIGHT FAILED
U 1083, 0000,003C,0180,0800,0000,1084   ;2181                   NOP
                                        ;2182   ;//////////////////////////////////////////////////////////////////
                                        ;2183   ;+
                                        ;2184   ; SUBTEST       3
                                        ;2185   ;       LEFT SHIFT D SINGLE (UDK=5,USI=3)
                                        ;2186   ;       BEN D31? ASSERTED
                                        ;2187   ;       BEN D0? DEASSERTED
                                        ;2188   ;-
                                        ;2189   =0
U 1084, 0000,003D,0180,0800,0000,1134   ;2190   DPT3:           SUBTEST
U 1085, 0003,003C,0180,09E8,0000,1088   ;2191                   RC[OD]_0                ;ERROR #0
U 1088, 0000,003D,0180,0800,0000,111E   ;2192   =0              ERLOOP
U 1089, 081B,0000,0580,0800,0000,12E8   ;2193                   ALU_0-K[.1],D_ALU
U 12E8, 0018,0038,19F8,0800,0000,12E9   ;2194                   ALU_0(K),Q_0
U 12E9, 0600,003C,0180,0800,0000,12EA   ;2195                   D_D.RIGHT,SI/ZERO       ; SET UP FOR TEST
U 12EA, 0500,003C,0180,0800,0000,12EB   ;2196                   D_D.LEFT,SI/ZERO        ; TEST INSTRUCTION
U 12EB, 0001,0D3C,0180,09F0,0000,1086   ;2197                   D31?,RC[OE]_D
U 1086, 0000,003D,0180,0800,0000,1124   ;2198   =110            ERROR1                  ; EITHER D_D.LEFT OR
                                        ;2199                                           ; BEN D31? FAILED
U 1087, 0018,0038,0580,09E8,0000,12EC   ;2200                   RC[OD]_K[.1]            ; ERROR #1
U 12EC, 0000,193C,0180,0800,0000,107E   ;2201                   D0?                     ; SEE IF D<00>=0
U 107E, 0000,003C,0180,0800,0000,108A   ;2202   =1110           J/DPT4
U 107F, 0000,003D,0180,0800,0000,1124   ;2203                   ERROR1                  ; EITHER BEN D0? FAILED
                                        ;2204                                           ; OR BAD ETCH OR CHIP ON DBP
U 12ED, 0000,003C,0180,0800,0000,108A   ;2205                   NOP
                                        ;2206   ;//////////////////////////////////////////////////////////////////
                                        ;2207   ;+
                                        ;2208   ; SUBTEST       4
```

```
                                          ;2209   ;       USI MUX SELECTS
                                          ;2210   ;       BEN D0? (ASSERTED)
                                          ;2211   ;-
                                          ;2212   =0
U 108A, 0000,003D,0180,0800,0000,1134     ;2213   DPT4:           SUBTEST
U 108B, 0003,003C,0180,09E8,0000,108C     ;2214                   RC[OD]_0                ; ERROR #0
U 108C, 0000,003D,0180,0800,0000,111E     ;2215   =0              ERLOOP
U 108D, 081B,0000,05C0,0800,0000,12EE     ;2216                   ALU_0-K[.1],D_ALU,Q_ALU ;
U 12EE, 0001,193C,0180,09F0,0000,108E     ;2217                   D0?,RC[OE]_D
U 108E, 0000,003D,0180,0800,0000,1124     ;2218   =1110           ERROR1                  ; BEN D0? FAILED
U 108F, 0018,0038,0580,09E8,0000,12EF     ;2219                   RC[OD]_K[.1]            ; ERROR #1
U 12EF, 0018,0038,C180,0800,0000,12F0     ;2220                   ALU_K[.FFFF]            ; PRESENT ALL 1'S TO OTHER
U 12F0, 0600,003C,0200,0800,0000,12F1     ;2221                   D_D.RIGHT,SI/4          ; USI INPUTS, TEST ALL GROUNDED
U 12F1, 0001,0D3C,0180,09F0,0000,1096     ;2222                   D31?,RC[OE]_D           ; INPUT PINS
U 1096, 0000,003C,0180,0800,0000,12F2     ;2223   =110            J/DPT4A
U 1097, 0000,003D,0180,0800,0000,1124     ;2224                   ERROR1                  ; USI MUX SELECTS FAILED
U 12F2, 0018,0038,C180,0800,0000,12F3     ;2225   DPT4A:          ALU_K[.FFFF]            ; LATCH 1'S IN PREV ALU REG
U 12F3, 0600,003C,0100,0800,0000,12F4     ;2226                   D_D.RIGHT,SI/2          ; TEST 0 INPUT AT SELECTS=2
U 12F4, 0001,0D3C,0180,09F0,0000,109E     ;2227                   D31?,RC[OE]_D
U 109E, 0000,003C,0180,0800,0000,1090     ;2228   =110            J/DPT5
U 109F, 0000,003D,0180,0800,0000,1124     ;2229                   ERROR1                  ; USI MUX SELECTS FAILED
                                          ;2230   ;//////////////////////////////////////////////////////////////////////
                                          ;2231   ;+
                                          ;2232   ; SUBTEST       5
                                          ;2233   ;       RIGHT SHIFT D DOUBLE
                                          ;2234   ;       LEFT SHIFT D DOUBLE
                                          ;2235   ;-
                                          ;2236   =0
U 1090, 0000,003D,0180,0800,0000,1134     ;2237   DPT5:           SUBTEST
U 1091, 0003,003C,0180,09E8,0000,1092     ;2238                   RC[OD]_0                ; ERROR #0
U 1092, 0000,003D,0180,0800,0000,111E     ;2239   =0              ERLOOP
U 1093, 0818,0038,1180,0800,0000,12F5     ;2240                   D_K[.4]
U 12F5, 0200,003C,0180,0800,0000,12F6     ;2241                   D_D.RIGHT2,SI/ZERO      ; TEST INSTRUCTION
U 12F6, 0019,0000,0580,0800,0010,12F7     ;2242                   ALU_D-K[.1],CLK.UBCC    ; SEE IF IT SHIFTED
U 12F7, 0001,013C,0180,09F0,0000,1094     ;2243                   Z?,RC[OE]_D
U 1094, 0000,003D,0180,0800,0000,1124     ;2244   =0              ERROR1                  ; D_D.RIGHT2 FAILED
U 1095, 0100,003C,0180,0800,0000,12F8     ;2245                   D_D.LEFT2,SI/ZERO       ; TEST INSTRUCTION
U 12F8, 0019,0000,1180,0800,0010,12F9     ;2246                   ALU_D-K[.4],CLK.UBCC    ; SEE IF IT SHIFTED BACK
U 12F9, 0001,013C,0180,09F0,0000,1098     ;2247                   Z?,RC[OE]_D
U 1098, 0000,003D,0180,0800,0000,1124     ;2248   =0              ERROR1                  ; D_D.LEFT2 FAILED
U 1099, 0000,003C,0180,0800,0000,109A     ;2249                   NOP
                                          ;2250   ;//////////////////////////////////////////////////////////////////////
                                          ;2251   ;+
                                          ;2252   ; SUBTEST       6
                                          ;2253   ;       PREVIOUS ALU REGISTER (FIRST "1" TO BE SHIFTED INTO D)
                                          ;2254   ;       USI=7
                                          ;2255   ;-
                                          ;2256   =0
U 109A, 0000,003D,0180,0800,0000,1134     ;2257   DPT6:           SUBTEST
U 109B, 0003,003C,0180,09F0,0000,109C     ;2258                   RC[OE]_0                ; ERROR #0
U 109C, 0000,003D,0180,0800,0000,111E     ;2259   =0              ERLOOP
U 109D, 0F18,0038,19F8,0800,0000,12FA     ;2260                   ALU_0(K),Q_0,D_0
U 12FA, 0100,003C,0380,0800,0000,12FB     ;2261                   D_D.LEFT2,SI/7
U 12FB, 0001,003C,0180,0800,0010,12FC     ;2262                   ALU_D,CLK.UBCC
U 12FC, 0001,013C,0180,09F0,0000,10A0     ;2263                   Z?,RC[OE]_D
```

```
U 10A0, 0000,003D,0180,0800,0000,1124   ;2264   =0              ERROR1                          ; PREV ALU REG OR IT'S DCP
                                        ;2265                                                   ; SOURCE FAILED
U 10A1, 0F18,0038,05F8,09E8,0000,12FD   ;2266                   ALU_K[.1],Q_0,RC[0D]_ALU,D_0
U 12FD, 0100,003C,0380,0800,0000,12FE   ;2267                   D_D.LEFT2,SI/7                  ; FIRST ATTEMPT AT A''1''INPUT
U 12FE, 0019,0000,0980,0800,0010,12FF   ;2268                   A[U_D-K[.2],CLK.UBCC
U 12FF, 0001,013C,0180,09F0,0000,10A2   ;2269                   Z?,RC[0E]_D
U 10A2, 0000,003D,0180,0800,0000,1124   ;2270   =0              ERROR1                          ; PREV ALU,DCP,CHIP ITSELF
                                        ;2271                                                   ; OR INPUT TIED LOW
U 10A3, 0F18,0038,09F8,09E8,0000,1300   ;2272                   ALU_K[.2],RC[0D]_ALU,D_0,Q_0
U 1300, 0100,003C,0380,0800,0000,1301   ;2273                   D_D.LEFT2,SI/7
U 1301, 0019,0000,0580,0800,0010,1302   ;2274                   A[U_D-K[.1],CLK.UBCC
U 1302, 0001,013C,0180,09F0,0000,10A4   ;2275                   Z?,RC[0E]_D
U 10A4, 0000,003D,0180,0800,0000,1124   ;2276   =0              ERROR1                          ; PREV ALU REG OR DCP FAILED
U 10A5, 0000,003C,0180,0800,0000,10A8   ;2277                   NOP
```

```
                                           ;2278                   .PAGE   "TEST 41        D SHIFT LEFT TEST"
                                           ;2279   ;*****************************************************************
                                           ;2280   ;++
                                           ;2281   ; TEST  41      D SHIFT LEFT TEST
                                           ;2282   ;
                                           ;2283   ; TEST DESCRIPTION
                                           ;2284   ;       D LEFT SHIFT TEST. FILL D WITH ALTERNATING
                                           ;2285   ;       1'S AND 0'S. THEN LEFT SHIFT 4 BITS OUT OF D AND TEST
                                           ;2286   ;       EACH.
                                           ;2287   ;
                                           ;2288   ; LOGIC DESCRIPTION
                                           ;2289   ;       THIS IS A TEST OF LOGIC ENTIRELY ON THE DBP MODULE.
                                           ;2290   ;
                                           ;2291   ; ERROR DESCRIPTION
                                           ;2292   ;       D AFTER BEING FILLED WITH ALTERNATING 1'S AND 0'S
                                           ;2293   ;               D=AAAAAAAA
                                           ;2294   ;       D AFTER BEING SHIFTED ONE PLACE LEFT (SHIFT IN 0)
                                           ;2295   ;
                                           ;2296   ;--
                                           ;2297   ;*****************************************************************
                                           ;2298   =0
U 10A8, 0000,003D,0180,0800,0000,10CE      ;2299   DPT15:  NEWTST
U 10A9, 0F00,003C,0180,0800,0000,10AA      ;2300           D_0                     ; D=0
                                           ;2301   ; EACH OF THESE CALLS TO DCAAAA WILL SHIFT 16 BITS
                                           ;2302   ; OF THE ALTERNATING 1'S AND 0'S TEST PATTERN
                                           ;2303   ; INTO D.
U 10AA, 0000,003D,0180,0800,0000,1164      ;2304   =0      CALL,J/DCAAAA           ; D=0000AAAA
U 10AB, 0000,003C,0180,0800,0000,10AC      ;2305           NOP
U 10AC, 0000,003D,0180,0800,0000,1164      ;2306   =0      CALL,J/DCAAAA           ; D=0AAAAAAAA
U 10AD, 0018,0038,0980,09F8,0000,1303      ;2307           RC[0F]_K[.2]
U 1303, 0001,003C,0180,09F0,0000,1304      ;2308           RC[0E]_D                ; SAVE D IN RC[0E]
                                           ;2309                                   ; SHOULD BE D=0AAAAAAAA
U 1304, 0000,0D3C,0180,0800,0000,10A6      ;2310           D31?                    ; BEN D<31>
U 10A6, 0001,003D,0180,09E8,0000,1124      ;2311   =110    ERROR1,RC[0D]_D
U 10A7, 0500,003C,0180,0800,0000,1305      ;2312           D_D.LEFT,SI/ZERO        ; D=55555554
U 1305, 0000,0D3C,0180,0800,0000,10AE      ;2313           D31?                    ; BEN D<31>
U 10AE, 0500,003C,0180,0800,0000,1306      ;2314   =110    D_D.LEFT,SI/ZERO,J/DPT15C ; D=AAAAAAA8
U 10AF, 0001,003D,0180,09E8,0000,1124      ;2315           ERROR1,RC[0D]_D
U 1306, 0000,0D3C,0180,0800,0000,10B6      ;2316   DPT15C: D31?                    ; BEN D<31>
U 10B6, 0001,003D,0180,09E8,0000,1124      ;2317   =110    ERROR1,RC[0D]_D
U 10B7, 0500,003C,0180,0800,0000,1307      ;2318           D_D.LEFT,SI/ZERO        ; D=55555550
U 1307, 0000,0D3C,0180,0800,0000,10BE      ;2319           D31?                    ; BEN D<31>
U 10BE, 0500,003C,0180,0800,0000,1308      ;2320   =110    D_D.LEFT,SI/ZERO,J/DPT15E ; D=AAAAAAA0
U 10BF, 0001,003D,0180,09E8,0000,1124      ;2321           ERROR1,RC[0D]_D
U 1308, 0000,0D3C,0180,0800,0000,10C6      ;2322   DPT15E: D31?
U 10C6, 0001,003D,0180,09E8,0000,1124      ;2323   =110    ERROR1,RC[0D]_D
U 10C7, 0000,003C,0180,0800,0000,10B0      ;2324           NOP
```

```
                                                 .PAGE   "TEST 42        D SHIFT RIGHT TEST"
                                          ;*************************************************************
                                          ;++
                                          ; TEST  42      D SHIFT RIGHT TEST
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       D RIGHT SHIFT TEST. FIRST USE D LEFT
                                          ;       SHIFT FUNCTION TO GENERATE EXPECTED DATA.
                                          ;       THEN RIGHT SHIFT A 32-BIT ALTERNATING 0'S
                                          ;       AND 0'S TEST PATTERN INTO D. THEN USE ALU
                                          ;       FUNCTION A-B TO CHECK THE RIGHT SHIFT
                                          ;       RESULT AGAINST THE LEFT SHIFTED RESULT WHICH
                                          ;       IS KNOWN TO BE CORRECT.
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;       THIS TESTS LOGIC ON THE DBP MODULE.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       EXPECTED RESULT
                                          ;       ACTUAL RESULT
                                          ;
                                          ;--
                                          ;*************************************************************
                                          =0
U 10B0, 0000,003D,0180,0800,0000,10CE     DPT16:  NEWTST
U 10B1, 0F00,003C,0180,0800,0000,10B2             D_0
                                          ; GENERATE EXPECTED RESULT, D=0AAAAAAAA, USING
                                          ; LEFT SHIFTS.
U 10B2, 0000,003D,0180,0800,0000,1164     =0      CALL,J/DCAAAA
U 10B3, 0000,003C,0180,0800,0000,10B4             NOP
U 10B4, 0000,003D,0180,0800,0000,1164     =0      CALL,J/DCAAAA           ; D=0AAAAAAAA
                                          ; SAVE THIS EXPECTED DATA IN Q AND RC[0E]
U 10B5, 0018,0038,0980,09F8,0000,1309             RC[0F]_K[.2]
U 1309, 0001,003C,01E0,09F0,0000,10B8             Q_D,RC[0E]_D
                                          ; GENERATE RIGHT SHIFTS IN D USING THE ROUTINE
                                          ; DRAAAA, WHICH WILL RIGHT SHIFT A 16 BIT PATTERN
                                          ; OF ALTERNATING 1'S AND 0'S INTO D.
U 10B8, 0F00,003D,0180,0800,0000,1186     =0      D_0,CALL,J/DRAAAA       ; D=0AAAA0000
U 10B9, 0000,003C,0180,0800,0000,10BA             NOP
U 10BA, 0000,003D,0180,0800,0000,1186     =0      CALL,J/DRAAAA           ; D=0AAAAAAAA
                                          ; SAVE RESULTANT D IN R2
U 10BB, 0001,003C,0180,09E8,0000,130A             RC[0D]_D
                                          ; CMP RESULT IN D WITH EXPECTED RESULT IN Q.
                                          ; Q SHOULD EQUAL D, SO Q-D SHOULD EQUAL 0.
U 130A, 001D,2000,0180,0800,0010,130B             ALU_Q-D,CLK.UBCC
U 130B, 0000,013C,0180,0800,0000,10BC             Z?                      ; RESULT CORRECT?
U 10BC, 0000,003D,0180,0800,0000,1124     =0      ERROR1                  ; RIGHT SHIFT D FUNCTION FAILED.
U 10BD, 0000,003C,0180,0800,0000,10C0             NOP
```

```
                                      ;2373           .PAGE   "TEST 43        BEN/D3-0 TEST"
                                      ;2374   ;*************************************************************
                                      ;2375   ;++
                                      ;2376   ; TEST  43      BEN/D3-0 TEST
                                      ;2377   ;
                                      ;2378   ; TEST DESCRIPTION
                                      ;2379   ;       EACH OF THE D REGISTERS BITS<03:00> IS ASSERTED
                                      ;2380   ;       BY ITSELF AND THE BRANCH TAKEN.
                                      ;2381   ;
                                      ;2382   ; LOGIC DESCRIPTION
                                      ;2383   ;       THIS IS A TEST LOGIC ON THE DBP MODULE WHICH
                                      ;2384   ;       DECODES AND ENABLES THIS BRANCH CONDITION.
                                      ;2385   ;
                                      ;2386   ; ERROR DESCRIPTION
                                      ;2387   ;       LOW ORDER 4 BITS OF WHERE THE BRANCH ACTUALLY WENT
                                      ;2388   ;       EXPECTED LOW ORDER 4 BITS (TESTED BIT SET)
                                      ;2389   ;
                                      ;2390   ;--
                                      ;2391   ;*************************************************************
                                      ;2392   =0
U 10C0, 0000,003D,0180,0800,0000,10CE ;2393   BD30:   NEWTST
U 10C1, 0018,0038,0980,09F8,0000,10C2 ;2394           RC[OF]_K[.2]
                                      ;2395   ;/////////////7/////////////////////////////////////////////
                                      ;2396   ;+
                                      ;2397   ; SUBTEST       1
                                      ;2398   ; TEST BEN D3-0, WITH D<03:00>=0
                                      ;2399   ; NOTE THE SUBROUTINE,BRTBLE, IS USED AS A TARGET
                                      ;2400   ; FOR THE 16 WAY BRANCH INVOKED BY BEN/D3-0
                                      ;2401   ; IF D<03:00>=N THEN BRTBLE WILL, AS A RESULT
                                      ;2402   ; OF THE BEN/D3-0, COMPUTE THE VALUE OF
                                      ;2403   ; Q-(15-N). IF THIS VALUE IS 0 BRTBLE WILL USE
                                      ;2404   ; RETURN2, OTHERWISE RETURN1 WILL BE USED
                                      ;2405   ; TO RETURN HERE.
                                      ;2406   ;-
                                      ;2407   =0
U 10C2, 0000,003D,0180,0800,0000,1134 ;2408   DPT19:  SUBTEST
U 10C3, 0000,003C,0180,0800,0000,10C4 ;2409           NOP
U 10C4, 0000,003D,0180,0800,0000,111E ;2410   =0      ERLOOP
U 10C5, 0F03,003C,0180,09E8,0000,10C8 ;2411           D_0,RC[OD]_0
U 10C8, 0000,003D,0180,0800,0000,101F ;2412   =0      CALL,J/DCF                ; D=0F
U 10C9, 0000,003C,01E0,0800,0000,130C ;2413           Q_D                       ; Q=0F
U 130C, 0F00,003C,0180,0800,0000,1008 ;2414           D_0
U 1008, 0000,193D,0180,0800,0000,1020 ;2415   =00     CALL,D3-0?,J/BRTBLE       ; TEST INSTRUCTION
U 1009, 0001,203D,0180,09F0,0000,1124 ;2416           ERROR1,RC[OE]_Q           ; BEN/D3-0 FAILED WITH D<03:00>
                                      ;2417                                     ; ZEROES.
U 100A, 0000,003C,0180,0800,0000,10CA ;2418           NOP
                                      ;2419   =
                                      ;2420   ;////////////////////////////////////////////////////////////
                                      ;2421   ;+
                                      ;2422   ; SUBTEST       2
                                      ;2423   ; TEST BEN D3-0, WITH D<03:00>=1
                                      ;2424   ; NOTE THE SUBROUTINE,BRTBLE, IS USED AS A TARGET
                                      ;2425   ; FOR THE 16 WAY BRANCH INVOKED BY BEN/D3-0
                                      ;2426   ; IF D<03:00>=N THEN BRTBLE WILL, AS A RESULT
                                      ;2427   ; OF THE BEN/D3-0, COMPUTE THE VALUE OF
```

```
                                            ;2428   ; Q-(15-N). IF THIS VALUE IS 0 BRTBLE WILL USE
                                            ;2429   ; RETURN2, OTHERWISE RETURN1 WILL BE USED
                                            ;2430   ;-
                                            ;2431   =0
U 10CA, 0000,003D,0180,0800,0000,1134       ;2432   DPT20:  SUBTEST
U 10CB, 0000,003C,0180,0800,0000,10D0       ;2433           NOP
U 10D0, 0000,003D,0180,0800,0000,111E       ;2434   =0      ERLOOP
U 10D1, 0F18,0038,0580,09E8,0000,10D2       ;2435           D_0,RC[0D]_K[.1]
U 10D2, 0000,003D,0180,0800,0000,101E       ;2436   =0      CALL,J/DCE              ; D=0E
U 10D3, 0000,003C,01E0,0800,0000,10D8       ;2437           Q_D                     ; Q=0E
U 10D8, 0000,003D,0180,0800,0000,1011       ;2438   =0      CALL,J/DC1              ; D<03:00>=1
U 10D9, 0000,003C,0180,0800,0000,1040       ;2439           NOP
U 1040, 0000,193D,0180,0800,0000,1020       ;2440   =00     CALL,D3-0?,J/BRTBLE     ; TEST INSTRUCTION
U 1041, 0001,203D,0180,09F0,0000,1124       ;2441           ERROR1,RC[0E]_Q
U 1042, 0000,003C,0180,0800,0000,10DA       ;2442           NOP
                                            ;2443   =
                                            ;2444   ;//////////////////////////////////////////////////////////////////
                                            ;2445   ;+
                                            ;2446   ; SUBTEST        3
                                            ;2447   ; TEST BEN D3-0 WITH D<03:00>=2
                                            ;2448   ; NOTE THE SUBROUTINE,BRTBLE, IS USED AS A TARGET
                                            ;2449   ; FOR THE 16 WAY BRANCH INVOKED BY BEN/D3-0
                                            ;2450   ; IF D<03:00>=N THEN BRTBLE WILL, AS A RESULT
                                            ;2451   ; OF THE BEN/D3-0, COMPUTE THE VALUE OF
                                            ;2452   ; Q-(15-N). IF THIS VALUE IS 0 BRTBLE WILL USE
                                            ;2453   ; RETURN2, OTHERWISE RETURN1 WILL BE USED
                                            ;2454   ;-
                                            ;2455   =0
U 10DA, 0000,003D,0180,0800,0000,1134       ;2456   DPT21:  SUBTEST
U 10DB, 0000,003C,0180,0800,0000,10E0       ;2457           NOP
U 10E0, 0000,003D,0180,0800,0000,111E       ;2458   =0      ERLOOP
U 10E1, 0F18,0038,0980,09E8,0000,10E2       ;2459           D_0,RC[0D]_K[.2]
U 10E2, 0000,003D,0180,0800,0000,101D       ;2460   =0      CALL,J/DCD              ; D=0D
U 10E3, 0000,003C,01E0,0800,0000,10E8       ;2461           Q_D                     ; Q=0D
U 10E8, 0000,003D,0180,0800,0000,1012       ;2462   =0      CALL,J/DC2              ; D<03:00>=2
U 10E9, 0000,003C,0180,0800,0000,1048       ;2463           NOP
U 1048, 0000,193D,0180,0800,0000,1020       ;2464   =00     CALL,D3-0?,J/BRTBLE     ; TEST INSTRUCTION
U 1049, 0001,203D,0180,09F0,0000,1124       ;2465           ERROR1,RC[0E]_Q
U 104A, 0000,003C,0180,0800,0000,10EA       ;2466           NOP
                                            ;2467   =
                                            ;2468   ;//////////////////////////////////////////////////////////////////
                                            ;2469   ;+
                                            ;2470   ; SUBTEST        4
                                            ;2471   ; TEST BEN D3-0, WITH D<03:00>=4
                                            ;2472   ; NOTE THE SUBROUTINE,BRTBLE, IS USED AS A TARGET
                                            ;2473   ; FOR THE 16 WAY BRANCH INVOKED BY BEN/D3-0
                                            ;2474   ; IF D<03:00>=N THEN BRTBLE WILL, AS A RESULT
                                            ;2475   ; OF THE BEN/D3-0, COMPUTE THE VALUE OF
                                            ;2476   ; Q-(15-N). IF THIS VALUE IS 0 BRTBLE WILL USE
                                            ;2477   ; RETURN2, OTHERWISE RETURN1 WILL BE USED
                                            ;2478   ;-
                                            ;2479   =0
U 10EA, 0000,003D,0180,0800,0000,1134       ;2480   DPT22:  SUBTEST
U 10EB, 0000,003C,0180,0800,0000,10F0       ;2481           NOP
U 10F0, 0000,003D,0180,0800,0000,111E       ;2482   =0      ERLOOP
```

```
U 10F1, 0F18,0038,1180,09E8,0000,10F2   ;2483            D_0,RC[0D]_K[.4]
U 10F2, 0000,003D,0180,0800,0000,101B   ;2484    =0      CALL,J/DCB                ; D=0B
U 10F3, 0000,003C,01E0,0800,0000,10F8   ;2485            Q_D                       ; Q=0B
U 10F8, 0000,003D,0180,0800,0000,1014   ;2486    =0      CALL,J/DC4                ; D<03:00>=4
U 10F9, 0000,003C,0180,0800,0000,1050   ;2487            NOP
U 1050, 0000,193D,0180,0800,0000,1020   ;2488    =00     CALL,D3-0?,J/BRTBLE       ; TEST INSTRUCTION
U 1051, 0001,203D,0180,09F0,0000,1124   ;2489            ERROR1,RC[0E]_Q
U 1052, 0000,003C,0180,0800,0000,10FA   ;2490            NOP
                                        ;2491    =
                                        ;2492    ;///////////////////////////////////////////////////////////////////
                                        ;2493    ;+
                                        ;2494    ; SUBTEST       5
                                        ;2495    ; TEST BEN D-0, WITH D<03:00>=8
                                        ;2496    ; NOTE THE SUBROUTINE,BRTBLE, IS USED AS A TARGET
                                        ;2497    ; FOR THE 16 WAY BRANCH INVOKED BY BEN/D3-0
                                        ;2498    ; IF D<03:00>=N THEN BRTBLE WILL, AS A RESULT
                                        ;2499    ; OF THE BEN/D3-0, COMPUTE THE VALUE OF
                                        ;2500    ; Q-(15-N). IF THIS VALUE IS 0 BRTBLE WILL USE
                                        ;2501    ; RETURN2, OTHERWISE RETURN1 WILL BE USED
                                        ;2502    ;-
                                        ;2503    =0
U 10FA, 0000,003D,0180,0800,0000,1134   ;2504    DPT23:  SUBTEST
U 10FB, 0000,003C,0180,0800,0000,110A   ;2505            NOP
U 110A, 0000,003D,0180,0800,0000,111E   ;2506    =0      ERLOOP
U 110B, 0F18,0038,0180,09E8,0000,1110   ;2507            D_0,RC[0D]_K[.8]
U 1110, 0000,003D,0180,0800,0000,1017   ;2508    =0      CALL,J/DC7                ; D=07
U 1111, 0000,003C,01E0,0800,0000,1112   ;2509            Q_D                       ; Q=07
U 1112, 0000,003D,0180,0800,0000,1018   ;2510    =0      CALL,J/DC8                ; D<03:00>=8
U 1113, 0000,003C,0180,0800,0000,1070   ;2511            NOP
U 1070, 0000,193D,0180,0800,0000,1020   ;2512    =00     CALL,D3-0?,J/BRTBLE       ; TEST INSTRUCTION
U 1071, 0001,203D,0180,09F0,0000,1124   ;2513            ERROR1,RC[0E]_Q
U 1072, 0000,003C,0180,0800,0000,1118   ;2514            NOP
                                        ;2515    =
                                          ;2516           .PAGE   "TEST 44        BEN/D.NE.0 TEST"
                                          ;2517   ;*******************************************************************
                                          ;2518   ;++
                                          ;2519   ; TEST  44      BEN/D.NE.0 TEST
                                          ;2520   ;
                                          ;2521   ; TEST DESCRIPTION
                                          ;2522   ;       THIS IS A TEST OF THE D.NE.0 BRANCH ENABLE.
                                          ;2523   ;       A 1 IS FLOATED ACCROSS A FIELD OF 0'S TO GENERATE
                                          ;2524   ;       TEST DATA IN THE DREGISTER WITH WHICH THE BRANCH IS
                                          ;2525   ;       TESTED.
                                          ;2526   ;
                                          ;2527   ; LOGIC DESCRIPTION
                                          ;2528   ;
                                          ;2529   ; ERROR DESCRIPTION
                                          ;2530   ;       ACTUAL CONTENTS OF D REGISTER WHEN BRANCH ISSUED
                                          ;2531   ;
                                          ;2532   ;--
                                          ;2533   ;*******************************************************************
                                          ;2534   =0
U 1118, 0000,003D,0180,0800,0000,10CE     ;2535   BDNEOT: NEWTST
U 1119, 0018,0038,0580,09F8,0000,130D     ;2536           RC[OF]_K[.1]
U 130D, 0F18,0038,C180,0800,0000,130E     ;2537           D_0,ALU_K[.FFFF]
U 130E, 0500,003C,0380,0800,0000,130F     ;2538           D_D.LEFT,SI/7    ; INITIALIZE D TO 1
U 130F, 0501,0D3C,0180,09F0,0000,10CD     ;2539           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 10CD, 0000,003D,0180,0800,0000,1124     ;2540   =101    ERROR1                 ; D.NE.0? FAILED WITH D=1
U 10CF, 0501,0D3C,0180,09F0,0000,10D5     ;2541           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 10D5, 0000,003D,0180,0800,0000,1124     ;2542   =101    ERROR1                 ; D.NE.0? FAILED WITH D=2
U 10D7, 0501,0D3C,0180,09F0,0000,10DD     ;2543           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 10DD, 0000,003D,0180,0800,0000,1124     ;2544   =101    ERROR1                 ; D.NE.0? FAILED WITH D=4
U 10DF, 0501,0D3C,0180,09F0,0000,10E5     ;2545           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 10E5, 0000,003D,0180,0800,0000,1124     ;2546   =101    ERROR1                 ; D.NE.0? FAILED WITH D=8
U 10E7, 0501,0D3C,0180,09F0,0000,10ED     ;2547           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 10ED, 0000,003D,0180,0800,0000,1124     ;2548   =101    ERROR1                 ; D.NE.0? FAILED WITH D=10
U 10EF, 0501,0D3C,0180,09F0,0000,10F5     ;2549           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 10F5, 0000,003D,0180,0800,0000,1124     ;2550   =101    ERROR1                 ; D.NE.0? FAILED WITH D=20
U 10F7, 0501,0D3C,0180,09F0,0000,10FD     ;2551           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 10FD, 0000,003D,0180,0800,0000,1124     ;2552   =101    ERROR1                 ; D.NE.0? FAILED WITH D=40
U 10FF, 0501,0D3C,0180,09F0,0000,1115     ;2553           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 1115, 0000,003D,0180,0800,0000,1124     ;2554   =101    ERROR1                 ; D.NE.0? FAILED WITH D=80
U 1117, 0501,0D3C,0180,09F0,0000,111D     ;2555           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 111D, 0000,003D,0180,0800,0000,1124     ;2556   =101    ERROR1                 ; D.NE.0? FAILED WITH D=100
U 111F, 0501,0D3C,0180,09F0,0000,1125     ;2557           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 1125, 0000,003D,0180,0800,0000,1124     ;2558   =101    ERROR1                 ; D.NE.0? FAILED WITH D=200
U 1127, 0501,0D3C,0180,09F0,0000,112D     ;2559           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 112D, 0000,003D,0180,0800,0000,1124     ;2560   =101    ERROR1                 ; D.NE.0? FAILED WITH D=400
U 112F, 0501,0D3C,0180,09F0,0000,1135     ;2561           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 1135, 0000,003D,0180,0800,0000,1124     ;2562   =101    ERROR1                 ; D.NE.0? FAILED WITH D=800
U 1137, 0501,0D3C,0180,09F0,0000,113D     ;2563           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 113D, 0000,003D,0180,0800,0000,1124     ;2564   =101    ERROR1                 ; D.NE.0? FAILED WITH D=1000
U 113F, 0501,0D3C,0180,09F0,0000,1145     ;2565           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 1145, 0000,003D,0180,0800,0000,1124     ;2566   =101    ERROR1                 ; D.NE.0? FAILED WITH D=2000
U 1147, 0501,0D3C,0180,09F0,0000,114D     ;2567           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 114D, 0000,003D,0180,0800,0000,1124     ;2568   =101    ERROR1                 ; D.NE.0? FAILED WITH D=4000
U 114F, 0501,0D3C,0180,09F0,0000,115D     ;2569           D.NE.0?,RC[OE]_D,D_D.LEFT,SI/ZERO
U 115D, 0000,003D,0180,0800,0000,1124     ;2570   =101    ERROR1                 ; D.NE.0? FAILED WITH D=8000
```

```
U 115F, 0501,0D3C,0180,09F0,0000,1165    ;2571              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 1165, 0000,003D,0180,0800,0000,1124    ;2572    =101      ERROR1                   ; D.NE.0? FAILED WITH D=10000
U 1167, 0501,0D3C,0180,09F0,0000,116D    ;2573              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 116D, 0000,003D,0180,0800,0000,1124    ;2574    =101      ERROR1                   ; D.NE.0? FAILED WITH D=20000
U 116F, 0501,0D3C,0180,09F0,0000,1175    ;2575              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 1175, 0000,003D,0180,0800,0000,1124    ;2576    =101      ERROR1                   ; D.NE.0? FAILED WITH D=40000
U 1177, 0501,0D3C,0180,09F0,0000,117D    ;2577              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 117D, 0000,003D,0180,0800,0000,1124    ;2578    =101      ERROR1                   ; D.NE.0? FAILED WITH D=80000
U 117F, 0501,0D3C,0180,09F0,0000,1185    ;2579              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 1185, 0000,003D,0180,0800,0000,1124    ;2580    =101      ERROR1                   ; D.NE.0? FAILED WITH D=100000
U 1187, 0501,0D3C,0180,09F0,0000,118D    ;2581              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 118D, 0000,003D,0180,0800,0000,1124    ;2582    =101      ERROR1                   ; D.NE.0? FAILED WITH D=200000
U 118F, 0501,0D3C,0180,09F0,0000,1195    ;2583              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 1195, 0000,003D,0180,0800,0000,1124    ;2584    =101      ERROR1                   ; D.NE.0? FAILED WITH D=400000
U 1197, 0501,0D3C,0180,09F0,0000,119D    ;2585              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 119D, 0000,003D,0180,0800,0000,1124    ;2586    =101      ERROR1                   ; D.NE.0? FAILED WITH D=800000
U 119F, 0501,0D3C,0180,09F0,0000,11A5    ;2587              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 11A5, 0000,003D,0180,0800,0000,1124    ;2588    =101      ERROR1                   ; D.NE.0? FAILED WITH D=1000000
U 11A7, 0501,0D3C,0180,09F0,0000,11AD    ;2589              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 11AD, 0000,003D,0180,0800,0000,1124    ;2590    =101      ERROR1                   ; D.NE.0? FAILED WITH D=2000000
U 11AF, 0501,0D3C,0180,09F0,0000,11B5    ;2591              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 11B5, 0000,003D,0180,0800,0000,1124    ;2592    =101      ERROR1                   ; D.NE.0? FAILED WITH D=4000000
U 11B7, 0501,0D3C,0180,09F0,0000,11BD    ;2593              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 11BD, 0000,003D,0180,0800,0000,1124    ;2594    =101      ERROR1                   ; D.NE.0? FAILED WITH D=8000000
U 11BF, 0501,0D3C,0180,09F0,0000,11C5    ;2595              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 11C5, 0000,003D,0180,0800,0000,1124    ;2596    =101      ERROR1                   ; D.NE.0? FAILED WITH D=10000000
U 11C7, 0501,0D3C,0180,09F0,0000,11CD    ;2597              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 11CD, 0000,003D,0180,0800,0000,1124    ;2598    =101      ERROR1                   ; D.NE.0? FAILED WITH D=20000000
U 11CF, 0501,0D3C,0180,09F0,0000,11D5    ;2599              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 11D5, 0000,003D,0180,0800,0000,1124    ;2600    =101      ERROR1                   ; D.NE.0? FAILED WITH D=40000000
U 11D7, 0501,0D3C,0180,09F0,0000,11DD    ;2601              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 11DD, 0000,003D,0180,0800,0000,1124    ;2602    =101      ERROR1                   ; D.NE.0? FAILED WITH D=80000000
U 11DF, 0501,0D3C,0180,09F0,0000,11E5    ;2603              D.NE.0?,RC[0E]_D,D_D.LEFT,SI/ZERO
U 11E5, 0000,003C,0180,0800,0000,1310    ;2604    =101      J/DNEOTD
U 11E7, 0000,003D,0180,0800,0000,1124    ;2605              ERROR1                   ; D.NE.0? FAILED WITH D=00000000
U 1310, 0000,003C,0180,0800,0000,111A    ;2606    DNEOTD:   NOP
```

```
                                         ;2607          .PAGE   "TEST 45        MISCELLANEOUS Q REGISTER FUNCTIONS TEST"
                                         ;2608   ;****************************************************************
                                         ;2609   ;++
                                         ;2610   ; TEST  45      MISCELLANEOUS Q REGISTER FUNCTIONS TEST
                                         ;2611   ;
                                         ;2612   ; TEST DESCRIPTION
                                         ;2613   ;       THIS IS A TEST OF LEFT AND RIGHT SHIFTS DONE SINGLE
                                         ;2614   ;       AND DOUBLE BIT POSITIONS IN THE Q REGISTER. ALSO TESTED
                                         ;2615   ;       ARE VARIOUS SHIFT INPUT VALUES AND BRANCH ENABLES
                                         ;2616   ;       WHICH ARE Q DEPENDENT.
                                         ;2617   ;
                                         ;2618   ; LOGIC DESCRIPTION
                                         ;2619   ;       THE LOGIC TESTED HERE IS DIVIDED UP IN SUCH A WAY THAT
                                         ;2620   ;       IT IS ON FOUR OF THE FIVE DATA PATH MODULES.
                                         ;2621   ;       THE UQK FIELD DECODE IS ON DAP.  THIS IS THE CONTROL
                                         ;2622   ;       LOGIC FOR Q REGISTER FUNCTIONS. THEN THE Q REGISTER AND QMX
                                         ;2623   ;       ARE BIT SLICED SUCH THAT:
                                         ;2624   ;               BITS <07:00>    ARE ON DCP
                                         ;2625   ;               BITS <15:08>    ARE ON DDP
                                         ;2626   ;               BITS <31:16>    ARE ON DEP
                                         ;2627   ;       THIS MEANS THAT IF THE CONTROL SIGNALS ARE INCORRECT DAP IS
                                         ;2628   ;       MOST LIKELY AT FAULT. CAREFUL EXAMINATION OF THE EXPECTED
                                         ;2629   ;       AND GOT DATA PATTERNS CAN BE USED TO ISOLATE THE FAILURE
                                         ;2630   ;       TO ONE OF THE BIT SLICES IF THE CONTROL SIGNALS ARE CORRECT.
                                         ;2631   ;
                                         ;2632   ; ERROR DESCRIPTION
                                         ;2633   ;       EXPECTED Q REGISTER
                                         ;2634   ;       ACTUAL RESULT
                                         ;2635   ;       ERROR CODE (SUBTEST 1 ONLY):
                                         ;2636   ;               0=>Q_0 FAILED
                                         ;2637   ;               1=>BEN/D (Q31?) FAILED
                                         ;2638   ;
                                         ;2639   ;--
                                         ;2640   ;****************************************************************
                                         ;2641   =0
U 111A, 0000,003D,0180,0800,0000,10CE    ;2642   QREG:   NEWTST
U 111B, 0018,0038,0D80,09F8,0000,1120    ;2643           RC[0F]_K[.3]
                                         ;2644   ;///////////7////////////////////////////////////////////////
                                         ;2645   ;+
                                         ;2646   ; SUBTEST       1
                                         ;2647   ; Q_0 AND BEN Q<31> TEST WITH Q<31>=0
                                         ;2648   ;-
                                         ;2649   =0
U 1120, 0000,003D,0180,0800,0000,1134    ;2650   DPT24:  SUBTEST
U 1121, 0000,003C,0180,0800,0000,1122    ;2651           NOP
U 1122, 0000,003D,0180,0800,0000,111E    ;2652   =0      ERLOOP
U 1123, 001B,0000,05C0,0800,0000,1311    ;2653           ALU_0-K[.1],Q_ALU
U 1311, 0000,003C,01F8,0800,0000,1312    ;2654           Q_0
U 1312, 0001,203C,0180,09E8,0010,1313    ;2655           RC[0D]_Q,CLK.UBCC
U 1313, 0003,013C,0180,09F0,0000,1128    ;2656           Z?,RC[0E]_0
U 1128, 0003,003D,0180,09E0,0000,1124    ;2657   =0      ERROR1,RC[0C]_0         ;Q_0 FAILED
U 1129, 0000,0D3C,0180,0800,0000,1153    ;2658           Q31?                    ; BEN Q<31>
U 1153, 0000,003C,0180,0800,0000,112A    ;2659   =011    J/DPT25
U 1157, 0018,0039,0580,09E0,0000,1124    ;2660           ERROR1,RC[0C]_K[.1]             ; BEN Q<31> FAILED.
                                         ;2661   ;////////////////////7///////////////////////////////////////
```

```
                                              ;2662   ;+
                                              ;2663   ; SUBTEST       2
                                              ;2664   ; BEN Q<31>, WITH Q<31>=1
                                              ;2665   ;-
                                              ;2666   =0
U 112A, 0000,003D,0180,0800,0000,1134         ;2667   DPT25:  SUBTEST
U 112B, 0000,003C,0180,0800,0000,1130         ;2668           NOP
U 1130, 0000,003D,0980,0800,0084,713C         ;2669   =0      SETRCF[.2]
U 1131, 0000,003C,0180,0800,0000,1132         ;2670           NOP
U 1132, 0000,003D,0180,0800,0000,111E         ;2671   =0      ERLOOP
U 1133, 0F18,0038,C180,0800,0000,1314         ;2672           D_0,ALU_K[.FFFF]
U 1314, 0600,003C,0380,0800,0000,1315         ;2673           D_D.RIGHT,SI/7          ; D=80000000
U 1315, 0001,003C,01E0,09F0,0000,1316         ;2674           Q_D,RC[OE]_D            ; D=80000000
U 1316, 0000,0D3C,0180,0800,0000,11EB         ;2675           Q31?                    ; BEN Q<31>
U 11EB, 0001,203D,0180,09E8,0000,1124         ;2676   =011    ERROR1,RC[OD]_Q
U 11EF, 0000,003C,0180,0800,0000,1138         ;2677           NOP
                                              ;2678   ;///////////////////////////////////////////////////////////////
                                              ;2679   ;+
                                              ;2680   ; SUBTEST       3
                                              ;2681   ; RIGHT SHIFT Q, INSERT 0 (UQK=6) (SI=3)
                                              ;2682   ; USE D REG FUNCTIONS TO GENERATE EXPECTED
                                              ;2683   ; DATA AND THE ALU TO CMP RESULT WITH EXPECTED
                                              ;2684   ; RESULT.
                                              ;2685   ;-
                                              ;2686   =0
U 1138, 0000,003D,0180,0800,0000,1134         ;2687   DPT26:  SUBTEST
U 1139, 0000,003C,0180,0800,0000,113A         ;2688           NOP
U 113A, 0000,003D,0180,0800,0000,111E         ;2689   =0      ERLOOP
U 113B, 0F00,003C,0180,0800,0000,1317         ;2690           D_0
U 1317, 0001,003C,0180,09F0,0000,1318         ;2691           RC[OE]_D                ; SAVE EXPECTED DATA
U 1318, 0000,003C,01F8,0800,0000,1319         ;2692           Q_0
U 1319, 0000,003C,01B0,0800,0000,131A         ;2693           Q_Q.RIGHT,SI/ZERO
U 131A, 001D,2000,0180,0800,0010,131B         ;2694           ALU_Q-D,CLK.UBCC
U 131B, 0000,013C,0180,0800,0000,1140         ;2695           Z?
U 1140, 0001,203D,0180,09E8,0000,1124         ;2696   =0      ERROR1,RC[OD]_Q         ; SINGLE LEFT SHIFT Q, 0 INPUT, FAILED.
U 1141, 0000,003C,0180,0800,0000,1142         ;2697           NOP
                                              ;2698   ;///////////////////////////////////////////////////////////////
                                              ;2699   ;+
                                              ;2700   ; SUBTEST       4
                                              ;2701   ; RIGHT SHIFT Q, INSERT 1, TEST (UQK=6) (SI=7)
                                              ;2702   ;-
                                              ;2703   =0
U 1142, 0000,003D,0180,0800,0000,1134         ;2704   DPT27:  SUBTEST
U 1143, 0000,003C,0180,0800,0000,1148         ;2705           NOP
U 1148, 0000,003D,0180,0800,0000,111E         ;2706   =0      ERLOOP
U 1149, 0F18,0038,C180,0800,0000,131C         ;2707           D_0,ALU_K[.FFFF]
U 131C, 0600,003C,0380,0800,0000,131D         ;2708           D_D.RIGHT,SI/7          ; GENERATE AND SAVE THE
U 131D, 0001,003C,0180,09F0,0000,131E         ;2709           RC[OE]_D                ; EXPECTED RESULT. D=80000000
U 131E, 0000,003C,01F8,0800,0000,131F         ;2710           Q_0
U 131F, 0000,003C,03B0,0800,0000,1320         ;2711           Q_Q.RIGHT,SI/7          ; Q=80000000.TEST INSTRUCTION.
U 1320, 001D,2000,0180,0800,0010,1321         ;2712           ALU_Q-D,CLK.UBCC
U 1321, 0000,013C,0180,0800,0000,114A         ;2713           Z?                      ; CHECK THE RESULT
U 114A, 0001,203D,0180,09E8,0000,1124         ;2714   =0      ERROR1,RC[OD]_Q
U 114B, 0000,003C,0180,0800,0000,1150         ;2715           NOP
                                              ;2716   ;///////////////////////////////////////////////////////////////
```

```
                                     ;2717     ;+
                                     ;2718     ; SUBTEST        5
                                     ;2719     ; DOUBLE RIGHT SHIFT Q, INPUT 1, TEST UQK=2 AND USI=7
                                     ;2720     ;-
                                     ;2721     =0
U 1150, 0000,003D,0180,0800,0000,1134  ;2722   DPT28:  SUBTEST
U 1151, 0000,003C,0180,0800,0000,1158  ;2723           NOP
U 1158, 0000,003D,0180,0800,0000,111E  ;2724   =0      ERLOOP
U 1159, 0F18,0038,C180,0800,0000,1322  ;2725           D_0,ALU_K[.FFFF]
U 1322, 0200,003C,0380,0800,0000,1323  ;2726           D_D.RIGHT2,SI/7          ; COMPUTE AND SAVE THE
U 1323, 0001,003C,0180,09F0,0000,1324  ;2727           RC[0E]_D                 ; EXPECTED RESULT.D=0C0000000
U 1324, 0000,003C,01F8,0800,0000,1325  ;2728           Q_0
U 1325, 0000,003C,0390,0800,0000,1326  ;2729           Q_Q.RIGHT2,SI/7          ; Q=0C0000000.TEST INSTRUCTION.
U 1326, 001D,2000,0180,0800,0010,1327  ;2730           ALU_Q-D,CLK.UBCC
U 1327, 0000,013C,0180,0800,0000,115A  ;2731           Z?                       ; CHECK THE RESULT
U 115A, 0001,203D,0180,09E8,0000,1124  ;2732   =0      ERROR1,RC[0D]_Q
U 115B, 0000,003C,0180,0800,0000,1160  ;2733           NOP
                                     ;2734     ;////////////////////////////////////////////////////////////
                                     ;2735     ;+
                                     ;2736     ; SUBTEST        6
                                     ;2737     ; SINGLE LEFT SHIFT Q, INSERT 0, TEST (UQK=5) (SI=3)
                                     ;2738     ;-
                                     ;2739     =0
U 1160, 0000,003D,0180,0800,0000,1134  ;2740   DPT29:  SUBTEST
U 1161, 0000,003C,0180,0800,0000,1162  ;2741           NOP
U 1162, 0000,003D,0180,0800,0000,111E  ;2742   =0      ERLOOP
U 1163, 0F00,003C,0180,0800,0000,1328  ;2743           D_0
U 1328, 0001,003C,0180,09F0,0000,1329  ;2744           RC[0E]_D                 ; GENERATE AND SAVE THE
                                     ;2745                                    ; EXPECTED RESULT. D=0
U 1329, 0000,003C,01F8,0800,0000,132A  ;2746           Q_0
U 132A, 0000,003C,01A8,0800,0000,132B  ;2747           Q_Q.LEFT,SI/ZERO         ; Q=0
U 132B, 001D,2000,0180,0800,0010,132C  ;2748           ALU_Q-D,CLK.UBCC
U 132C, 0000,013C,0180,0800,0000,1168  ;2749           Z?
U 1168, 0001,203D,0180,09E8,0000,1124  ;2750   =0      ERROR1,RC[0D]_Q
U 1169, 0000,003C,0180,0800,0000,116A  ;2751           NOP
                                     ;2752     ;////////////////////////////////////////////////////////////
                                     ;2753     ;+
                                     ;2754     ; SUBTEST        7
                                     ;2755     ; SINGLE LEFT SHIFT Q,INSERT 1, TEST (UQK=5) (SI=7)
                                     ;2756     ;-
                                     ;2757     =0
U 116A, 0000,003D,0180,0800,0000,1134  ;2758   DPT30:  SUBTEST
U 116B, 0000,003C,0180,0800,0000,1170  ;2759           NOP
U 1170, 0000,003D,0180,0800,0000,111E  ;2760   =0      ERLOOP
U 1171, 0F18,0038,C180,0800,0000,132D  ;2761           D_0,ALU_K[.FFFF]
U 132D, 0500,003C,0380,0800,0000,132E  ;2762           D_D.LEFT,SI/7            ; GENERATE AND SAVE EXPECTED
U 132E, 0001,003C,0180,09F0,0000,132F  ;2763           RC[0E]_D                 ; RESULT. D=1
U 132F, 0000,003C,01F8,0800,0000,1330  ;2764           Q_0
U 1330, 0000,003C,03A8,0800,0000,1331  ;2765           Q_Q.LEFT,SI/7            ; Q=1.TEST INSTRUCTION
U 1331, 001D,2000,0180,0800,0010,1332  ;2766           ALU_Q-D,CLK.UBCC
U 1332, 0000,013C,0180,0800,0000,1172  ;2767           Z?                       ; CHECK THE RESULT
U 1172, 0001,203D,0180,09E8,0000,1124  ;2768   =0      ERROR1,RC[0D]_Q
U 1173, 0000,003C,0180,0800,0000,1178  ;2769           NOP
                                     ;2770     ;////////////////////////////////////////////////////////////
                                     ;2771     ;+
                                        ;2772   ; SUBTEST       8
                                        ;2773   ; DOUBLE LEFT SHIFT Q, INSERT 1, TEST (UQK=1) (SI=7)
                                        ;2774   ;-
                                        ;2775   =0
U 1178, 0000,003D,0180,0800,0000,1134   ;2776   DPT31:  SUBTEST
U 1179, 0000,003C,0180,0800,0000,117A   ;2777           NOP
U 117A, 0000,003D,0180,0800,0000,111E   ;2778   =0      ERLOOP
U 117B, 0F18,0038,C180,0800,0000,1333   ;2779           D_0,ALU_K[.FFFF]
U 1333, 0100,003C,0380,0800,0000,1334   ;2780           D_D.LEFT2,SI/7              ; GENERATE AND SAVE EXPECTED
U 1334, 0001,003C,0180,09F0,0000,1335   ;2781           RC[OE]_D                    ; RESULT. D=3
U 1335, 0000,003C,01F8,0800,0000,1336   ;2782           Q_0
U 1336, 0000,003C,0388,0800,0000,1337   ;2783           Q_Q.LEFT2,SI/7              ; Q=3. TEST INSTRUCTION.
U 1337, 001D,2000,0180,0800,0010,1338   ;2784           ALU_Q-D,CLK.UBCC
U 1338, 0000,013C,0180,0800,0000,1182   ;2785           Z?                          ; CHECK THE RESULT
U 1182, 0001,203D,0180,09E8,0000,1124   ;2786   =0      ERROR1,RC[OD]_Q
U 1183, 0000,003C,0180,0800,0000,1188   ;2787           NOP
                                        ;2788   ;////////////////////////////////////////////////////////////////
                                        ;2789   ;+
                                        ;2790   ; SUBTEST       9
                                        ;2791   ; DOUBLE RIGHT SHIFT Q, INSERT 0'S, TEST (UQK-[illegible] (SI=3)
                                        ;2792   ;-
                                        ;2793   =0
U 1188, 0000,003D,0180,0800,0000,1134   ;2794   DPT32:  SUBTEST
U 1189, 0000,003C,0180,0800,0000,118A   ;2795           NOP
U 118A, 0000,003D,0180,0800,0000,111E   ;2796   =0      ERLOOP
U 118B, 0F18,0038,C180,0800,0000,1339   ;2797           D_0,ALU_K[.FFFF]
U 1339, 0600,003C,0380,0800,0000,133A   ;2798           D_D.RIGHT,SI/7
U 133A, 0200,003C,0180,0800,0000,133B   ;2799           D_D.RIGHT2,SI/ZERO          ; D=20000000
U 133B, 0001,003C,0180,09F0,0000,133C   ;2800           RC[OE]_D
                                        ;2801                                       ; EXPECTED RESULT. D=20000000
U 133C, 0000,003C,01F8,0800,0000,133D   ;2802           Q_0
U 133D, 0000,003C,0380,0800,0000,133E   ;2803           Q_Q.RIGHT,SI/7
U 133E, 0000,003C,0190,0800,0000,133F   ;2804           Q_Q.RIGHT2,SI/ZERO          ; Q=20000000
U 133F, 001D,2000,0180,0800,0010,1340   ;2805           ALU_Q-D,CLK.UBCC
U 1340, 0000,013C,0180,0800,0000,1190   ;2806           Z?                          ; CHECK THE RESULT.
U 1190, 0001,203D,0180,09E8,0000,1124   ;2807   =0      ERROR1,RC[OD]_Q
U 1191, 0000,003C,0180,0800,0000,1192   ;2808           NOP
                                        ;2809   ;////////////////////////////////////////////////////////////////
                                        ;2810   ;+
                                        ;2811   ; SUBTEST       A
                                        ;2812   ; DOUBLE LEFT SHIFT Q, INSERT 0'S, TEST (UQK=1) (USI=3)
                                        ;2813   ;-
                                        ;2814   =0
U 1192, 0000,003D,0180,0800,0000,1134   ;2815   DPT33:  SUBTEST
U 1193, 0000,003C,0180,0800,0000,1198   ;2816           NOP
U 1198, 0000,003D,0180,0800,0000,111E   ;2817   =0      ERLOOP
U 1199, 0F18,0038,C180,0800,0000,1341   ;2818           D_0,ALU_K[.FFFF]
U 1341, 0500,003C,0380,0800,0000,1342   ;2819           D_D.LEFT,SI/7
U 1342, 0100,003C,0180,0800,0000,1343   ;2820           D_D.LEFT2,SI/ZERO           ; GENERATE AND SAVE THE
U 1343, 0001,003C,0180,09F0,0000,1344   ;2821           RC[OE]_D                    ; EXPECTED RESULT. D=4
U 1344, 0000,003C,01F8,0800,0000,1345   ;2822           Q_0
U 1345, 0000,003C,03A8,0800,0000,1346   ;2823           Q_Q.LEFT,SI/7
U 1346, 0000,003C,0188,0800,0000,1347   ;2824           Q_Q.LEFT2,SI/ZERO           ; Q=4. TEST INSTRUCTION.
U 1347, 001D,2000,0180,0800,0010,1348   ;2825           ALU_Q-D,CLK.UBCC
U 1348, 0000,013C,0180,0800,0000,119A   ;2826           Z?                          ; CHECK THE RESULT.
```

```
U 119A, 0001,203D,0180,09E8,0000,1124   ;2827   =0      ERROR1,RC[0D]_Q
U 119B, 0000,003C,0180,0800,0000,11A0   ;2828           NOP
```

```
                                         .PAGE   "TEST 46        LEFT SHIFT Q REGISTER TEST"
                                 ;*****************************************************************
                                 ;++
                                 ; TEST  46       LEFT SHIFT Q TEST
                                 ;
                                 ; TEST DESCRIPTION
                                 ;       THIS IS A TEST OF THE Q REGISTER'S ABILITY TO SHIFT
                                 ;       LEFT SINGLE AN` DOUBLE. NOTE THAT THE D REGISTER
                                 ;       IS USED TO COMPUTE THE EXPECTED RESULT. THE TEST
                                 ;       DATA PATTERN IS A SERIES OF ALTERNATING 1'S AND 0'S.
                                 ;
                                 ; LOGIC DESCRIPTION
                                 ;       THE LOGIC TESTED HERE IS DIVIDED UP IN SUCH A WAY THAT
                                 ;       IT IS ON FOUR OF THE FIVE DATA PATH MODULES.
                                 ;       THE UQK FIELD DECODE IS ON DAP.  THIS IS THE CONTROL
                                 ;       LOGIC FOR Q REGISTER FUNCTIONS. THEN THE Q REGISTER AND QMX
                                 ;       ARE BIT SLICED SUCH THAT:
                                 ;               BITS <07:00>    ARE ON DCP
                                 ;               BITS <15:08>    ARE ON DDP
                                 ;               BITS <31:16>    ARE ON DEP
                                 ;       THIS MEANS THAT IF THE CONTROL SIGNALS ARE INCORRECT DAP IS
                                 ;       MOST LIKELY AT FAULT. CAREFUL EXAMINATION OF THE EXPECTED
                                 ;       AND GOT DATA PATTERNS CAN BE USED TO ISOLATE THE FAILURE
                                 ;       TO ONE OF THE BIT SLICES IF THE CONTROL SIGNALS ARE CORRECT.
                                 ;
                                 ; ERROR DESCRIPTION
                                 ;       EXPECTED RESULT
                                 ;       ACTUAL RESULT
                                 ;
                                 ;-
                                 ;*****************************************************************
                                 =0
U 11A0, 0000,003D,0180,0800,0000,10CE    DPT34:  NEWTST
U 11A1, 0F00,003C,0180,0800,0000,11A8            D_0
U 11A8, 0000,003D,0180,0800,0000,1164    =0      CALL,J/DCAAAA           ; D=0000AAAA
U 11A9, 0000,003C,0180,0800,0000,11AA            NOP
U 11AA, 0000,003D,0180,0800,0000,1164    =0      CALL,J/DCAAAA           ; D=0AAAAAAAA
U 11AB, 0000,003C,01E0,0800,0000,1349            Q_D                     ; Q=0AAAAAAAA
U 1349, 0018,0038,C180,0800,0000,134A            A[U_K[.FFFF]
U 134A, 0500,003C,0380,0800,0000,134B            D_D.LEFT,SI/7           ; D=55555555
U 134B, 0001,003C,0180,09F0,0000,134C            RC[0E]_D
U 134C, 0018,0038,0980,09F8,0000,134D            RC[0F]_K[.2]            ; SAVE EXPECTED DATA
U 134D, 0000,003C,03A8,0800,0000,134E            Q_Q.LEFT,SI/7           ; Q=55555555. TEST INSTRUCTION.
U 134E, 001D,2000,0180,0800,0010,134F            A[U_Q-D,CLK.UBCC
U 134F, 0000,013C,0180,0800,0000,11B0            Z?                      ; CHECK RESULTS.
U 11B0, 0001,203D,0180,09E8,0000,1124    =0      ERROR1,RC[0D]_Q
U 11B1, 0500,003C,0180,0800,0000,1350            D_D.LEFT,SI/ZERO        ; D=0AAAAAAAA
U 1350, 0001,003C,0180,09F0,0000,1351            RC[0E]_D                ; SAVE EXPECTED DATA.
U 1351, 0000,003C,01A8,0800,0000,1352            Q_Q.LEFT,SI/ZERO        ; Q=0AAAAAAAA.TEST INSTRUCTION.
U 1352, 001D,2000,0180,0800,0010,1353            A[U_Q-D,CLK.UBCC
U 1353, 0000,013C,0180,0800,0000,11B2            Z?                      ; CHECK RESULTS
U 11B2, 0001,203D,0180,09E8,0000,1124    =0      ERROR1,RC[0D]_Q
U 11B3, 0018,0038,C180,0800,0000,1354            ALU_K[.FFFF]
U 1354, 0500,003C,0380,0800,0000,1355            D_D.LEFT,SI/7           ; D=055555555
U 1355, 0001,003C,0180,09F0,0000,1356            RC[0E]_D                ; SAVE EXPECTED DATA.
```

```
U 1356, 0000,003C,03A8,0800,0000,1357   ;2884           Q_Q.LEFT,SI/7            ; Q=55555555
U 1357, 001D,2000,0180,0800,0010,1358   ;2885           ALU_Q-D,CLK.UBCC
U 1358, 0000,013C,0180,0800,0000,11B8   ;2886           Z?                       ; CHECK RESULTS
U 11B8, 0001,203D,0180,09E8,0000,1124   ;2887    =0     ERROR1,RC[OD]_Q
U 11B9, 0500,003C,0180,0800,0000,1359   ;2888           D_D.LEFT,SI/ZERO         ; D=0AAAAAAAA
U 1359, 0001,003C,0180,09F0,0000,135A   ;2889           RC[OE]_D                 ; SAVE EXPECTED DATA.
U 135A, 0000,003C,01A8,0800,0000,135B   ;2890           Q_Q.LEFT,SI/ZERO         ; Q=0AAAAAAAA
U 135B, 001D,2000,0180,0800,0010,135C   ;2891           ALU_Q-D,CLK.UBCC
U 135C, 0000,013C,0180,0800,0000,11BA   ;2892           Z?                       ; CHECK RESULTS
U 11BA, 0001,203D,0180,09E8,0000,1124   ;2893    =0     ERROR1,RC[OD]_Q
U 11BB, 0018,0038,C180,0800,0000,135D   ;2894           ALU_K[.FFFF]
U 135D, 0100,003C,0380,0800,0000,135E   ;2895           D_D.LEFT2,SI/7
U 135E, 0001,003C,0180,09F0,0000,135F   ;2896           RC[OE]_D
U 135F, 0000,003C,0388,0800,0000,1360   ;2897           Q_Q.LEFT2,SI/7
U 1360, 001D,2000,0180,0800,0010,1361   ;2898           ALU_Q-D,CLK.UBCC
U 1361, 0000,013C,0180,0800,0000,11C0   ;2899           Z?
U 11C0, 0001,203D,0180,09E8,0000,1124   ;2900    =0     ERROR1,RC[OD]_Q
U 11C1, 0100,003C,0180,0800,0000,1362   ;2901           D_D.LEFT2,SI/ZERO
U 1362, 0000,003C,0188,0800,0000,1363   ;2902           Q_Q.LEFT2,SI/ZERO
U 1363, 0001,003C,0180,09F0,0000,1364   ;2903           RC[OE]_D
U 1364, 001D,2000,0180,0800,0010,1365   ;2904           ALU_Q-D,CLK.UBCC
U 1365, 0000,013C,0180,0800,0000,11C2   ;2905           Z?
U 11C2, 0001,203D,0180,09E8,0000,1124   ;2906    =0     ERROR1,RC[OD]_Q
U 11C3, 0000,003C,0180,0800,0000,11C8   ;2907           NOP
```

```
                                         ;2908           .PAGE   "TEST 47        RIGHT SHIFT Q REGISTER TEST"
                                         ;2909   ;*************************************************************
                                         ;2910   ;++
                                         ;2911   ; TEST  47      RIGHT SHIFT Q REGISTER TEST
                                         ;2912   ;
                                         ;2913   ; TEST DESCRIPTION
                                         ;2914   ;       THIS IS A TEST OF THE ABILITY OF THE Q REGISTER
                                         ;2915   ;       TO SHIFT RIGHT SINGLE AND DOUBLE. EXPECTED
                                         ;2916   ;       RESULT ARE COMPUTED USING THE D REGISTER. TEST DATA CONSISTS
                                         ;2917   ;       OF A PATTERN OF ALTERNATING 1'S AND 0'S.
                                         ;2918   ;
                                         ;2919   ; LOGIC DESCRIPTION
                                         ;2920   ;       THE LOGIC TESTED HERE IS DIVIDED UP IN SUCH A WAY THAT
                                         ;2921   ;       IT IS ON FOUR OF THE FIVE DATA PATH MODULES.
                                         ;2922   ;       THE UQK FIELD DECODE IS ON DAP.  THIS IS THE CONTROL
                                         ;2923   ;       LOGIC FOR Q REGISTER FUNCTIONS. THEN THE Q REGISTER AND QMX
                                         ;2924   ;       ARE BIT SLICED SUCH THAT:
                                         ;2925   ;               BITS <07:00>    ARE ON DCP
                                         ;2926   ;               BITS <15:08>    ARE ON DDP
                                         ;2927   ;               BITS <31:16>    ARE ON DEP
                                         ;2928   ;       THIS MEANS THAT IF THE CONTROL SIGNALS ARE INCORRECT DAP IS
                                         ;2929   ;       MOST LIKELY AT FAULT. CAREFUL EXAMINATION OF THE EXPECTED
                                         ;2930   ;       AND GOT DATA PATTERNS CAN BE USED TO ISOLATE THE FAILURE
                                         ;2931   ;       TO ONE OF THE BIT SLICES IF THE CONTROL SIGNALS ARE CORRECT.
                                         ;2932   ;
                                         ;2933   ; ERROR DESCRIPTION
                                         ;2934   ;       EXPECTED RESULT
                                         ;2935   ;       ACTUAL RESULT
                                         ;2936   ;
                                         ;2937   ;--
                                         ;2938   ;*************************************************************
                                         ;2939   =0
U 11C8, 0000,003D,0180,0800,0000,10CE    ;2940   DPT35:  NEWTST
U 11C9, 0018,0038,0980,09F8,0000,11CA    ;2941           RC[OF]_K[.2]
U 11CA, 0F00,003D,0180,0800,0000,1164    ;2942   =0      D_0,CALL,J/DCAAAA       ; D=0000AAAA
U 11CB, 0000,003C,0180,0800,0000,11D0    ;2943           NOP
U 11D0, 0000,003D,0180,0800,0000,1164    ;2944   =0      CALL,J/DCAAAA           ; D=0AAAAAAA
U 11D1, 0018,0038,C1E0,0800,0000,1366    ;2945           Q_D,ALU_K[.FFFF]        ; Q=0AAAAAAA
U 1366, 0600,003C,0380,0800,0000,1367    ;2946           D_D.RIGHT,SI/7          ; D=55555555
U 1367, 0001,003C,03B0,09F0,0000,1368    ;2947           Q_Q.RIGHT,SI/7,RC[OE]_D ; Q=55555555
U 1368, 001D,2000,0180,0800,0010,1369    ;2948           ALU_Q-D,CLK.UBCC
U 1369, 0000,013C,0180,0800,0000,11D2    ;2949           Z?                      ; CHECK RESULT
U 11D2, 0001,203D,0180,09E8,0000,1124    ;2950   =0      ERROR1,RC[OD]_Q
U 11D3, 0600,003C,0180,0800,0000,136A    ;2951           D_D.RIGHT,SI/ZERO       ; D=0AAAAAAA
U 136A, 0001,003C,0180,09F0,0000,136B    ;2952           RC[OE]_D                ; SAVE EXPECTED RESULT
U 136B, 0000,003C,0180,0800,0000,136C    ;2953           Q_Q.RIGHT,SI/ZERO       ; Q=0AAAAAAA
U 136C, 001D,2000,0180,0800,0010,136D    ;2954           ALU_Q-D,CLK.UBCC
U 136D, 0000,013C,0180,0800,0000,11D8    ;2955           Z?                      ; CHECK RESULT
U 11D8, 0001,203D,0180,09E8,0000,1124    ;2956   =0      ERROR1,RC[OD]_Q
U 11D9, 0018,0038,C180,0800,0000,136E    ;2957           ALU_K[.FFFF]
U 136E, 0600,003C,0380,0800,0000,136F    ;2958           D_D.RIGHT,SI/7          ; D=55555555
U 136F, 0001,003C,0180,09F0,0000,1370    ;2959           RC[OE]_D                ; SAVE EXPECTED RESULT
U 1370, 0000,003C,03B0,0800,0000,1371    ;2960           Q_Q.RIGHT,SI/7          ; Q=55555555
U 1371, 001D,2000,0180,0800,0010,1372    ;2961           ALU_Q-D,CLK.UBCC
U 1372, 0000,013C,0180,0800,0000,11DA    ;2962           Z?                      ; CHECK RESULT
```

```
U 11DA, 0001,203D,0180,09E8,0000,1124   ;2963   =0      ERROR1,RC[0D]_Q
U 11DB, 0600,003C,0180,0800,0000,1373   ;2964           D_D.RIGHT,SI/ZERO       ; D=0AAAAAAA
U 1373, 0001,003C,0180,09F0,0000,1374   ;2965           RC[0E]_D                ; SAVE EXPECTED RESULT
U 1374, 0000,003C,01B0,0800,0000,1375   ;2966           Q_Q.RIGHT,SI/ZERO       ; Q=0AAAAAAA
U 1375, 001D,2000,0180,0800,0010,1376   ;2967           ALU_Q-D,CLK.UBCC
U 1376, 0000,013C,0180,0800,0000,11E0   ;2968           Z?                      ; CHECK RESULT
U 11E0, 0001,203D,0180,09E8,0000,1124   ;2969   =0      ERROR1,RC[0D]_Q
U 11E1, 0200,003C,0180,0800,0000,1377   ;2970           D_D.RIGHT2,SI/ZERO
U 1377, 0001,003C,0180,09F0,0000,1378   ;2971           RC[0E]_D
U 1378, 0000,003C,0190,0800,0000,1379   ;2972           Q_Q.RIGHT2,SI/ZERO
U 1379, 001D,2000,0180,0800,0010,137A   ;2973           ALU_Q-D,CLK.UBCC
U 137A, 0000,013C,0180,0800,0000,11E2   ;2974           Z?
U 11E2, 0001,203D,0180,09E8,0000,1124   ;2975   =0      ERROR1,RC[0D]_Q
U 11E3, 0018,0038,C180,0800,0000,137B   ;2976           ALU_K[.FFFF]
U 137B, 0200,003C,0380,0800,0000,137C   ;2977           D_D.RIGHT2,SI/7
U 137C, 0001,003C,0180,09F0,0000,137D   ;2978           RC[0E]_D
U 137D, 0000,003C,0390,0800,0000,137E   ;2979           Q_Q.RIGHT2,SI/7
U 137E, 001D,2000,0180,0800,0010,137F   ;2980           ALU_Q-D,CLK.UBCC
U 137F, 0000,013C,0180,0800,0000,11E8   ;2981           Z?
U 11E8, 0001,203D,0180,09E8,0000,1124   ;2982   =0      ERROR1,RC[0D]_Q
U 11E9, 0000,003C,0180,0800,0000,11EC   ;2983           NOP
```

```
                                          ;2984           .PAGE   "TEST 48        FLOAT 1 THROUGH 0'S IN RA AND RB REGISTERS TEST"
                                          ;2985   ;*****************************************************************
                                          ;2986   ;++
                                          ;2987   ; TEST  48      FLOATING 1 THROUGH 0'S TEST OF RA AND RB REGISTERS
                                          ;2988   ;
                                          ;2989   ; TEST DESCRIPTION
                                          ;2990   ;       THIS TEST FLOATS A 1 ACROSS A FIELD OF 0'S
                                          ;2991   ;       IN EACH RA AND RB SCRATCH PAD.
                                          ;2992   ;
                                          ;2993   ; LOGIC DESCRIPTION
                                          ;2994   ;       THIS IS A TEST OF THE REGISTER CONTROL FIELD ON DAP
                                          ;2995   ;       ALONG WITH THE REGISTER ADDRESS MUX'S. ALSO TESTED ARE
                                          ;2996   ;       THE REGISTERS THEMSELVES AND THEIR INPUTS TO THE AMX AND BMX.
                                          ;2997   ;       IF THE REGISTER ADDRESSES ARE INCORRECT THEN DAP IS MOST
                                          ;2998   ;       LIKELY TO BE THE CAUSE. IF THE PROBLEM IS NOT WITH THE CONTROL
                                          ;2999   ;       OR ADDRESS SIGNALS THEN ONE OF THE BIT SLICES IS AT FAULT.
                                          ;3000   ;       THE BITS ARE PARTITIONED THUS:
                                          ;3001   ;               BITS <07:00>    ON DCP
                                          ;3002   ;               BITS <15:08>    ON DDP
                                          ;3003   ;               BITS <31:16>    ON DEP
                                          ;3004   ;       CAREFUL INSPECTION OF THE EXPECTED AND THE ACTUAL DATA RECIEVED
                                          ;3005   ;       SHOULD IDENTIFY WHICH BIT SLICE FAILED.
                                          ;3006   ;
                                          ;3007   ; ERROR DESCRIPTION
                                          ;3008   ;       EXPECTED DATA
                                          ;3009   ;       GOT DATA
                                          ;3010   ;       REGISTER ADDRESS IN LOW ORDER 4 BITS ONLY
                                          ;3011   ;
                                          ;3012   ;--
                                          ;3013   ;*****************************************************************
                                          ;3014   =0
U 11EC, 0000,003D,0180,0800,0000,10CE     ;3015   FL1RAB: NEWTST
U 11ED, 0000,003C,01F8,0800,0000,11F0     ;3016           Q_0
U 11F0, 0000,003D,0180,0800,0000,1044     ;3017   =0      CALL,J/RARB.Q           ; CLEAR ALL RA AND RB
U 11F1, 0018,0038,0D80,09F8,0000,11F2     ;3018           RC[OF]_K[.3]
U 11F2, 0000,003D,0180,0800,0000,11A6     ;3019   =0      CALL,J/DC.NF            ; SET UP COUNTER.
U 11F3, 0000,003C,01E0,0800,0000,11F4     ;3020   FL1RAB1:        Q_D
U 11F4, 0000,003D,0180,0800,0000,111E     ;3021   =0      ERLOOP
U 11F5, 0C00,003C,0180,0800,0000,1380     ;3022           D_Q
U 1380, 0018,0038,05C0,0800,0000,1381     ;3023           Q_K[.1]                 ; SET UP TEST PATTERN
U 1381, 0001,003C,0180,09E0,0000,11F6     ;3024   FL1RAB2:        RC[OC]_D
U 11F6, 0001,193D,0180,09E0,0000,1030     ;3025   =0      RC[OC]_D,CALL,D3-0?,J/WRRARB ; WRITE TEST PATTERN
U 11F7, 0001,203C,0180,09F0,0000,11F8     ;3026           RC[OE]_Q
U 11F8, 0000,193D,0180,0800,0000,1060     ;3027   =0      CALL,D3-0?,J/LTCHAB     : READ TEST PATTERN
U 11F9, 001C,0000,0180,0800,0010,1382     ;3028           ALU_LA[A-B]Q,CLK.UBCC
U 1382, 0000,013C,0180,0800,0000,11FA     ;3029           Z?                      ; Q=LA?
U 11FA, 0000,003D,01E0,09E8,0000,1124     ;3030   =0      Q_D,RC[OD]_LA,ERROR1
U 11FB, 000D,2000,0180,0800,0010,1383     ;3031           A[U_Q[A-B][B,CLK.UBCC
U 1383, 0000,013C,0180,0800,0000,11FC     ;3032           Z?                      ; Q=LB?
U 11FC, 000C,0039,01E0,09E8,0000,1124     ;3033   =0      Q_D,RC[OD]_LB,ERROR1
U 11FD, 0001,203C,0180,0800,0010,1384     ;3034           A[U_Q,CLK.UBCC
U 1384, 0000,013C,0180,0800,0000,11FE     ;3035           Z?                      ; REGISTER, TESTED,Q=0?
U 11FE, 0000,003C,01A8,0800,0000,1381     ;3036   =0      Q_Q.LEFT,SI/ZERO,J/FL1RAB2 ; NO, SO GENERATE NEXT
                                          ;3037                                   ; TEST PATTERN AND LOOP.
U 11FF, 0819,0014,0580,0800,0010,1385     ;3038           D_D+K[.1],CLK.UBCC
```

```
U 1385, 0000,013C,0180,0800,0000,1200   ;3039           Z?                      ; ALL REGISTERS TESTED?
U 1200, 0000,003C,0180,0800,0000,11F3   ;3040   =0      J/FL1RAB1
U 1201, 0000,003C,0180,0800,0000,1202   ;3041           NOP
```

```
                                            ;3042           .PAGE   "TEST 49        FLOAT 0 THROUGH 1'S IN RA AND RB REGISTERS TEST"
                                            ;3043   ;*************************************************************
                                            ;3044   ;++
                                            ;3045   ; TEST  49      FLOATING 0 THROUGH 1'S TEST OF RA AND RB REGISTERS
                                            ;3046   ;
                                            ;3047   ; TEST DESCRIPTION
                                            ;3048   ;       THIS TEST FLOATS A 0 ACROSS A FIELD OF 1'S IN
                                            ;3049   ;       EACH RA AND RB SCRATCH PAD.
                                            ;3050   ;
                                            ;3051   ; LOGIC DESCRIPTION
                                            ;3052   ;       THIS IS A TEST OF THE REGISTER CONTROL FIELD ON DAP
                                            ;3053   ;       ALONG WITH THE REGISTER ADDRESS MUX'S. ALSO TESTED ARE
                                            ;3054   ;       THE REGISTERS THEMSELVES AND THEIR INPUTS TO THE AMX AND BMX.
                                            ;3055   ;       IF THE REGISTER ADDRESSES ARE INCORRECT THEN DAP IS MOST
                                            ;3056   ;       LIKELY TO BE THE CAUSE. IF THE PROBLEM IS NOT WITH THE CONTROL
                                            ;3057   ;       OR ADDRESS SIGNALS THEN ONE OF THE BIT SLICES IS AT FAULT.
                                            ;3058   ;       THE BITS ARE PARTITIONED THUS:
                                            ;3059   ;               BITS <07:00>    ON DCP
                                            ;3060   ;               BITS <15:08>    ON DDP
                                            ;3061   ;               BITS <31:16>    ON DEP
                                            ;3062   ;       CAREFUL INSPECTION OF THE EXPECTED AND THE ACTUAL DATA RECIEVED
                                            ;3063   ;       SHOULD IDENTIFY WHICH BIT SLICE FAILED.
                                            ;3064   ;
                                            ;3065   ; ERROR DESCRIPTION
                                            ;3066   ;       EXPECTED DATA
                                            ;3067   ;       GOT DATA
                                            ;3068   ;       REGISTER ADDRESS IN LOW ORDER FOUR BITS ONLY
                                            ;3069   ;
                                            ;3070   ;--
                                            ;3071   ;*************************************************************
                                            ;3072   =0
U 1202, 0000,003D,0180,0800,0000,10CE       ;3073   FLORAB: NEWTST
U 1203, 0000,003C,01F8,0800,0000,1386       ;3074           Q_0
U 1386, 0019,2000,05C0,0800,0000,1204       ;3075           Q_Q-K[.1]
U 1204, 0000,003D,0180,0800,0000,1044       ;3076   =0      CALL,J/RARB.Q           ; SET ALL REGISTERS TO-1.
U 1205, 0018,0038,0D80,09F8,0000,1206       ;3077           RC[0F]_K[.3]
U 1206, 0000,003D,0180,0800,0000,11A6       ;3078   =0      CALL,J7DC.NF            ; SET UP COUNTER
U 1207, 0000,003C,01E0,0800,0000,1208       ;3079   FLORAB1:        Q_D
U 1208, 0000,003D,0180,0800,0000,111E       ;3080   =0      ERLOOP
U 1209, 0C00,003C,0180,0800,0000,1387       ;3081           D_Q
U 1387, 0000,003C,01F8,0800,0000,1388       ;3082           Q_0
U 1388, 0019,2000,05C0,0800,0000,1389       ;3083           Q_Q-K[.1]
U 1389, 0000,003C,01B0,0800,0000,138A       ;3084           Q_Q.RIGHT,SI/ZERO       ; SET UP TEST PATTERN
U 138A, 0001,003C,0180,09E0,0000,120A       ;3085   FLORAB2:        RC[0C]_D
U 120A, 0000,193D,0180,0800,0000,1030       ;3086   =0      CALL,D3-0?,J/WRRARB     ; WRITE TEST PATTERN
U 120B, 0001,203C,0180,09F0,0000,120C       ;3087           RC[0E]_Q
U 120C, 0000,193D,0180,0800,0000,1060       ;3088   =0      CALL,D3-0?,J/LTCHAB     ; READ TEST PATTERN
U 120D, 001C,0000,0180,0800,0010,138B       ;3089           ALU_LA[A-B]Q,CLK.UBCC
U 138B, 0000,013C,0180,0800,0000,120E       ;3090           Z?                      ; Q=LA?
U 120E, 0000,003D,01E0,09E8,0000,1124       ;3091   =0      Q_D,RC[0D]_LA,ERROR1
U 120F, 000D,2000,0180,0800,0010,138C       ;3092           A[U_Q[A-B][B,CLK.UBCC
U 138C, 0000,013C,0180,0800,0000,1210       ;3093           Z?                      ; Q=LB?
U 1210, 000C,0039,01E0,09E8,0000,1124       ;3094   =0      Q_D,RC[0D]_LB,ERROR1
U 1211, 0019,2014,0580,0800,0010,138D       ;3095           A[U_Q+K[.1],CLK.UBCC
U 138D, 0000,013C,0180,0800,0000,1212       ;3096           Z?                      ; REG. TESTED, Q=-1?
```

```
U 1212, 0000,003C,03B0,0800,0000,138A   ;3097    =0      Q_Q.RIGHT,SI/7,J/FLORAB2 ; NO, SO GENERATE NEXT
                                        ;3098                                     ; TEST PATTERN AND LOOP.
U 1213, 0819,0014,0580,0800,0010,138E   ;3099            D_D+K[.1],CLK.UBCC
U 138E, 0000,013C,0180,0800,0000,1214   ;3100            Z?                       ; ALL REGISTERS
                                        ;3101                                     ; TESTED?
U 1214, 0000,003C,0180,0800,0000,1207   ;3102    =0      J/FLORAB1
U 1215, 0000,003C,0180,0800,0000,1216   ;3103            NOP
```

```
                                          ;3104          .PAGE   "TEST 4A       RA AND RB REGISTERS FOREWARD DUAL ADDRESSINC TEST"
                                          ;3105   ;*************************************************************************
                                          ;3106   ;++
                                          ;3107   ; TEST  4A      RA AND RB FOREWARD DUAL ADDRESSING TEST
                                          ;3108   ;
                                          ;3109   ; TEST DESCRIPTION
                                          ;3110   ;       THIS TEST WRITES THE PATTERN:
                                          ;3111   ;               00000000        IN R[0]
                                          ;3112   ;               11111111        IN R[1]
                                          ;3113   ;               22222222        IN R[2]
                                          ;3114   ;               33333333        IN R[3]
                                          ;3115   ;                  ETC. TO
                                          ;3116   ;               FFFFFFFF        IN R[0F]
                                          ;3117   ;       AND THEN GOES BACK TO READ THE PATTERNS OUT. HERE
                                          ;3118   ;       THE REGISTERS ARE WRITTEN IN THE FOREWARD, INCREMENTING THE ADDRESS,
                                          ;3119   ;       DIRECTION.
                                          ;3120   ;
                                          ;3121   ; LOGIC DESCRIPTION
                                          ;3122   ;       THIS IS A TEST OF THE REGISTER CONTROL FIELD ON DAP
                                          ;3123   ;       ALONG WITH THE REGISTER ADDRESS MUX'S. ALSO TESTED ARE
                                          ;3124   ;       THE REGISTERS THEMSELVES AND THEIR INPUTS TO THE AMX AND BMX.
                                          ;3125   ;       IF THE REGISTER ADDRESSES ARE INCORRECT THEN DAP IS MOST
                                          ;3126   ;       LIKELY TO BE THE CAUSE. IF THE PROBLEM IS NOT WITH THE CONTROL
                                          ;3127   ;       OR ADDRESS SIGNALS THEN ONE OF THE BIT SLICES IS AT FAULT.
                                          ;3128   ;       THE BITS ARE PARTITIONED THUS:
                                          ;3129   ;               BITS <07:00>    ON DCP
                                          ;3130   ;               BITS <15:08>    ON DDP
                                          ;3131   ;               BITS <31:16>    ON DEP
                                          ;3132   ;       CAREFUL INSPECTION OF THE EXPECTED AND THE ACTUAL DATA RECIEVED
                                          ;3133   ;       SHOULD IDENTIFY WHICH BIT SLICE FAILED.
                                          ;3134   ;
                                          ;3135   ; ERROR DESCRIPTION
                                          ;3136   ;       EXPECTED DATA, ALSO REG ADDRESS IN BITS <03:00>
                                          ;3137   ;       GOT DATA
                                          ;3138   ;
                                          ;3139   ;--
                                          ;3140   ;*************************************************************************
                                          ;3141   =0
U 1216, 0000,003D,0180,0800,0000,10CE     ;3142   RABDA1: NEWTST
U 1217, 0F00,003C,0180,0800,0000,1218     ;3143           D_0             ; INITIALIZE DATA AND REGISTER ADDRESS
                                          ;3144   =0
U 1218, 0000,193D,0180,0800,0000,1010     ;3145   RABD1A: CALL,D3-0?,J/DC0
U 1219, 0000,003C,0180,0800,0000,121A     ;3146           NOP
U 121A, 0000,193D,0180,0800,0000,1010     ;3147   =0      CALL,D3-0?,J/DC0
U 121B, 0000,003C,0180,0800,0000,121C     ;3148           NOP
U 121C, 0000,193D,0180,0800,0000,1010     ;3149   =0      CALL,D3-0?,J/DC0
U 121D, 0000,003C,0180,0800,0000,121E     ;3150           NOP
U 121E, 0000,193D,0180,0800,0000,1010     ;3151   =0      CALL,D3-0?,J/DC0
U 121F, 0000,003C,0180,0800,0000,1220     ;3152           NOP
U 1220, 0000,193D,0180,0800,0000,1010     ;3153   =0      CALL,D3-0?,J/DC0
U 1221, 0000,003C,0180,0800,0000,1222     ;3154           NOP
U 1222, 0000,193D,0180,0800,0000,1010     ;3155   =0      CALL,D3-0?,J/DC0
U 1223, 0000,003C,0180,0800,0000,1224     ;3156           NOP
U 1224, 0000,193D,0180,0800,0000,1010     ;3157   =0      CALL,D3-0?,J/DC0
U 1225, 0000,003C,0180,0800,0000,1226     ;3158           NOP
```

```
U 1226, 0000,193D,0180,0800,0000,1010   ;3159   =0      CALL,D3-0?,J/DCO
U 1227, 0000,003C,01E0,0800,0000,1228   ;3160           Q_D
U 1228, 0000,193D,0180,0800,0000,1030   ;3161   =0      CALL,D3-0?,J/WRRARB ; GO WRITE THIS DATA INTO
                                        ;3162                               ; THE REGISTER ADDRESSED BY D<03:00>
U 1229, 0819,0014,0580,0800,0010,138F   ;3163           ALU_D+K[.1],D_ALU,CLK.UBCC ; WRITTEN ALL REGISTER?
U 138F, 0000,013C,0180,0800,0000,122A   ;3164           Z?
U 122A, 0000,003C,0180,0800,0000,1218   ;3165   =0      J/RABD1A            ; IF NOT CONTINUE.
U 122B, 0F00,003C,01F8,0800,0000,122C   ;3166           D_0,Q_0             ; NOW GO READ ALL REGISTER BACK.
U 122C, 0000,003D,0180,0800,0000,111E   ;3167   =0      ERLOOP
U 122D, 0C00,003C,0180,0800,0000,122E   ;3168           D_Q
                                        ;3169   =0
U 122E, 0000,193D,0180,0800,0000,1010   ;3170   RABD1B: CALL,D3-0?,J/DCO
U 122F, 0000,003C,0180,0800,0000,1230   ;3171           NOP
U 1230, 0000,193D,0180,0800,0000,1010   ;3172   =0      CALL,D3-0?,J/DCO
U 1231, 0000,003C,0180,0800,0000,1232   ;3173           NOP
U 1232, 0000,193D,0180,0800,0000,1010   ;3174   =0      CALL,D3-0?,J/DCO
U 1233, 0000,003C,0180,0800,0000,1234   ;3175           NOP
U 1234, 0000,193D,0180,0800,0000,1010   ;3176   =0      CALL,D3-0?,J/DCO
U 1235, 0000,003C,0180,0800,0000,1236   ;3177           NOP
U 1236, 0000,193D,0180,0800,0000,1010   ;3178   =0      CALL,D3-0?,J/DCO
U 1237, 0000,003C,0180,0800,0000,1238   ;3179           NOP
U 1238, 0000,193D,0180,0800,0000,1010   ;3180   =0      CALL,D3-0?,J/DCO
U 1239, 0000,003C,0180,0800,0000,123A   ;3181           NOP
U 123A, 0000,193D,0180,0800,0000,1010   ;3182   =0      CALL,D3-0?,J/DCO
U 123B, 0000,003C,0180,0800,0000,123C   ;3183           NOP
U 123C, 0000,193D,0180,0800,0000,1010   ;3184   =0      CALL,D3-0?,J/DCO
U 123D, 0000,003C,01E0,0800,0000,123E   ;3185           Q_D
U 123E, 0000,193D,0180,0800,0000,1060   ;3186   =0      CALL,D3-0?,J/LTCHAB ; READ THE REGISTER.
U 123F, 001C,0000,0180,0800,0010,1390   ;3187           ALU_LA[A-B]Q,CLK.UBCC ; CORRECT?
U 1390, 0000,013C,0180,0800,0000,1240   ;3188           Z?
U 1240, 0000,003C,0180,0800,0000,1391   ;3189   =0      J/RABD1C
U 1241, 0000,003C,0180,0800,0000,1394   ;3190           J/RABD1D
U 1391, 0018,0038,0980,09F8,0000,1392   ;3191   RABD1C: RC[0F]_K[.2]      ; REPORT ERROR
U 1392, 0001,203C,0180,09F0,0000,1393   ;3192           RC[0E]_Q
U 1393, 0000,003D,0180,09E8,0000,1124   ;3193           RC[0D]_LA,ERROR1 ; RA ADDRESSING FAILURE.
U 1394, 000D,2000,0180,0800,0010,1395   ;3194   RABD1D: ALU_Q[A-B]LB,CLK.UBCC ; CHECK LB
U 1395, 0000,013C,0180,0800,0000,1242   ;3195           Z?
U 1242, 0000,003C,0180,0800,0000,1396   ;3196   =0      J/RABD1E
U 1243, 0000,003C,0180,0800,0000,1399   ;3197           J/RABD1F
U 1396, 0018,0038,0980,09F8,0000,1397   ;3198   RABD1E: RC[0F]_K[.2]
U 1397, 0001,203C,0180,09F0,0000,1398   ;3199           RC[0E]_Q
U 1398, 000C,0039,0180,09E8,0000,1124   ;3200           RC[0D]_LB,ERROR1 ; RB ADDRESSING FAILURE.
U 1399, 0819,0014,0580,0800,0010,139A   ;3201   RABD1F: ALU_D+K[.1],D_ALU,CLK.UBCC ; CHECKED ALL REGISTERS?
U 139A, 0000,013C,0180,0800,0000,1244   ;3202           Z?
U 1244, 0000,003C,0180,0800,0000,122E   ;3203   =0      J/RABD1B            ; IF NOT CONTINUE.
U 1245, 0000,003C,0180,0800,0000,1246   ;3204           NOP
```

```
                                                 .PAGE   "TEST 4B        RA AND RB REGISTERS BACKWARD DUAL ADDRESSINC TEST"
                                        ;**************************************************************
                                        ;++
                                        ; TEST  4B      RA AND RB BACKWARD DUAL ADDRESSING TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST WRITES THE PATTERN:
                                        ;               FFFFFFFF        IN R[OF]
                                        ;               EEEEEEEE        IN R[OE]
                                        ;               DDDDDDDD        IN R[OD]
                                        ;               CCCCCCCC        IN R[OC]
                                        ;                  ETC. TO
                                        ;               00000000        IN R[0]
                                        ;       AND THEN GOES BACK TO READ THE PATTERNS OUT. HERE
                                        ;       THE REGISTERS ARE WRITTEN IN THE BACKWARD, DECREMENTING THE ADDRESS,
                                        ;       DIRECTION.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS IS A TEST OF THE REGISTER CONTROL FIELD ON DAP
                                        ;       ALONG WITH THE REGISTER ADDRESS MUX'S. ALSO TESTED ARE
                                        ;       THE REGISTERS THEMSELVES AND THEIR INPUTS TO THE AMX AND BMX.
                                        ;       IF THE REGISTER ADDRESSES ARE INCORRECT THEN DAP IS MOST
                                        ;       LIKELY TO BE THE CAUSE. IF THE PROBLEM IS NOT WITH THE CONTROL
                                        ;       OR ADDRESS SIGNALS THEN ONE OF THE BIT SLICES IS AT FAULT.
                                        ;       THE BITS ARE PARTITIONED THUS:
                                        ;               BITS <07:00>    ON DCP
                                        ;               BITS <15:08>    ON DDP
                                        ;               BITS <31:16>    ON DEP
                                        ;       CAREFUL INSPECTION OF THE EXPECTED AND THE ACTUAL DATA RECIEVED
                                        ;       SHOULD IDENTIFY WHICH BIT SLICE FAILED.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED DATA, ALSO REG ADDRESS IN BITS <03:00>
                                        ;       GOT DATA
                                        ;
                                        ;--
                                        ;**************************************************************
                                        =0
U 1246, 0000,003D,0180,0800,0000,10CE   RABDA2: NEWTST
U 1247, 0F00,003C,0180,0800,0000,1248           D_0             ; INITIALIZE DATA AND REGISTER ADDRESS
U 1248, 0000,003D,0180,0800,0000,101F   =0      CALL,J/DCF
U 1249, 0000,003C,0180,0800,0000,124A           NOP
                                        =0
U 124A, 0000,193D,0180,0800,0000,1010   RABD2A: CALL,D3-0?,J/DC0
U 124B, 0000,003C,0180,0800,0000,124C           NOP
U 124C, 0000,193D,0180,0800,0000,1010   =0      CALL,D3-0?,J/DC0
U 124D, 0000,003C,0180,0800,0000,124E           NOP
U 124E, 0000,193D,0180,0800,0000,1010   =0      CALL,D3-0?,J/DC0
U 124F, 0000,003C,0180,0800,0000,1250           NOP
U 1250, 0000,193D,0180,0800,0000,1010   =0      CALL,D3-0?,J/DC0
U 1251, 0000,003C,0180,0800,0000,1252           NOP
U 1252, 0000,193D,0180,0800,0000,1010   =0      CALL,D3-0?,J/DC0
U 1253, 0000,003C,0180,0800,0000,1254           NOP
U 1254, 0000,193D,0180,0800,0000,1010   =0      CALL,D3-0?,J/DC0
U 1255, 0000,003C,0180,0800,0000,1256           NOP
```

```
U 1256, 0000,193D,0180,0800,0000,1010    ;3260    =0      CALL,D3-0?,J/DC0
U 1257, 0000,003C,0180,0800,0000,1258    ;3261            NOP
U 1258, 0000,193D,0180,0800,0000,1010    ;3262    =0      CALL,D3-0?,J/DC0
U 1259, 0000,003C,01E0,0800,0000,125A    ;3263            Q_D
U 125A, 0000,193D,0180,0800,0000,1030    ;3264    =0      CALL,D3-0?,J/WRRARB ; GO WRITE THIS DATA INTO
                                         ;3265                                ; THE REGISTER ADDRESSED BY D<03:00>
U 125B, 0001,003C,0180,0800,0010,139B    ;3266            ALU_D,CLK.UBCC ; WRITTEN ALL REGISTER?
U 139B, 0000,013C,0180,0800,0000,125C    ;3267            Z?
U 125C, 0819,0000,0580,0800,0000,124A    ;3268    =0      D_D-K[.1],J/RABD2A ; IF NOT CONTINUE.
U 125D, 0F00,003C,01F8,0800,0000,125E    ;3269            D_0,Q_0           ; NOW GO READ ALL REGISTER BACK.
U 125E, 0000,003D,0180,0800,0000,101F    ;3270    =0      CALL,J/DCF
U 125F, 0000,003C,01E0,0800,0000,1260    ;3271            Q_D
U 1260, 0000,003D,0180,0800,0000,111E    ;3272    =0      ERLOOP
U 1261, 0C00,003C,0180,0800,0000,1262    ;3273            D_Q
                                         ;3274    =0
U 1262, 0000,193D,0180,0800,0000,1010    ;3275    RABD2B: CALL,D3-0?,J/DC0
U 1263, 0000,003C,0180,0800,0000,1264    ;3276            NOP
U 1264, 0000,193D,0180,0800,0000,1010    ;3277    =0      CALL,D3-0?,J/DC0
U 1265, 0000,003C,0180,0800,0000,1266    ;3278            NOP
U 1266, 0000,193D,0180,0800,0000,1010    ;3279    =0      CALL,D3-0?,J/DC0
U 1267, 0000,003C,0180,0800,0000,1268    ;3280            NOP
U 1268, 0000,193D,0180,0800,0000,1010    ;3281    =0      CALL,D3-0?,J/DC0
U 1269, 0000,003C,0180,0800,0000,126A    ;3282            NOP
U 126A, 0000,193D,0180,0800,0000,1010    ;3283    =0      CALL,D3-0?,J/DC0
U 126B, 0000,003C,0180,0800,0000,126C    ;3284            NOP
U 126C, 0000,193D,0180,0800,0000,1010    ;3285    =0      CALL,D3-0?,J/DC0
U 126D, 0000,003C,0180,0800,0000,126E    ;3286            NOP
U 126E, 0000,193D,0180,0800,0000,1010    ;3287    =0      CALL,D3-0?,J/DC0
U 126F, 0000,003C,0180,0800,0000,1270    ;3288            NOP
U 1270, 0000,193D,0180,0800,0000,1010    ;3289    =0      CALL,D3-0?,J/DC0
U 1271, 0000,003C,01E0,0800,0000,1272    ;3290            Q_D
U 1272, 0000,193D,0180,0800,0000,1060    ;3291    =0      CALL,D3-0?,J/LTCHAB ; READ THE REGISTER.
U 1273, 001C,0000,0180,0800,0010,139C    ;3292            ALU_LA[A-B]Q,CLK.UBCC ; CORRECT?
U 139C, 0000,013C,0180,0800,0000,1274    ;3293            Z?
U 1274, 0000,003C,0180,0800,0000,139D    ;3294    =0      J/RABD2C
U 1275, 0000,003C,0180,0800,0000,13A0    ;3295            J/RABD2D
U 139D, 0018,0038,0980,09F8,0000,139E    ;3296    RABD2C: RC[0F]_K[.2]    ; REPORT ERROR
U 139E, 0001,203C,0180,09F0,0000,139F    ;3297            RC[0E]_Q
U 139F, 0000,003D,0180,09E8,0000,1124    ;3298            RC[0D]_LA,ERROR1 ; RA ADDRESSING FAILURE.
U 13A0, 000D,2000,0180,0800,0010,13A1    ;3299    RABD2D: ALU_Q[A-B]LB,CLK.UBCC ; CHECK LB
U 13A1, 0000,013C,0180,0800,0000,1276    ;3300            Z?
U 1276, 0000,003C,0180,0800,0000,13A2    ;3301    =0      J/RABD2E
U 1277, 0000,003C,0180,0800,0000,13A5    ;3302            J/RABD2F
U 13A2, 0018,0038,0980,09F8,0000,13A3    ;3303    RABD2E: RC[0F]_K[.2]
U 13A3, 0001,203C,0180,09F0,0000,13A4    ;3304            RC[0E]_Q
U 13A4, 000C,0039,0180,09E8,0000,1124    ;3305            RC[0D]_LB,ERROR1 ; RB ADDRESSING FAILURE.
U 13A5, 0001,003C,0180,0800,0010,13A6    ;3306    RABD2F: ALU_D,CLK.UBCC ; CHECKED ALL REGISTERS?
U 13A6, 0000,013C,0180,0800,0000,1278    ;3307            Z?
U 1278, 0819,0000,0580,0800,0000,1262    ;3308    =0      D_D-K[.1],J/RABD2B ; IF NOT CONTINUE.
U 1279, 0000,003C,0180,0800,0000,127A    ;3309            NOP
```

```
                                              .PAGE   "TEST 4C        GALLOP 1'S IN RA AND RB REGISTERS TEST"
                                       ;****************************************************************
                                       ;++
                                       ; TEST  4C      GALLOPING 1'S TEST IN RA AND RB REGISTERS
                                       ;
                                       ; TEST DESCRIPTION
                                       ;       THIS TEST PERFORMS A GALLOPPING 1'S TEST OF THE REGISTER
                                       ;       MEMORY CHIPS.
                                       ;       FIRST ALL MEMORY LOCATIONS (REGISTERS) ARE CLEARED
                                       ;       THEN R[0] IS SET TO FFFFFFFF. R[0] IS READ AND CHECKED,
                                       ;       R[1] IS READ AND CHECKED, R[0] IS READ AND CHECKED, R[2] IS
                                       ;       READ AND CHECKED, R[0] IS READ AND CHECKED, ......, R[0]
                                       ;       IS READ AND CHECK, AND R[0F] IS READ AND CHECKED.
                                       ;       AT THIS POINT R[0] IS SET TO 0, AND R[1] IS SET TO FFFFFFFF.
                                       ;       R[1] IS READ AND CHECKED, R[0] IS READ AND CHECK, R[2] IS READ
                                       ;       AND CHECKED, R[1] IS READ AND CHECKED, ETC. THIS IS DONE WITH
                                       ;       FFFFFFFF IN EACH REGISTER AND THE OTHER REGISTERS
                                       ;       CLEAR.
                                       ;
                                       ; LOGIC DESCRIPTION
                                       ;       THIS IS A TEST OF THE REGISTER CONTROL FIELD ON DAP
                                       ;       ALONG WITH THE REGISTER ADDRESS MUX'S. ALSO TESTED ARE
                                       ;       THE REGISTERS THEMSELVES AND THEIR INPUTS TO THE AMX AND BMX.
                                       ;       IF THE REGISTER ADDRESSES ARE INCORRECT THEN DAP IS MOST
                                       ;       LIKELY TO BE THE CAUSE. IF THE PROBLEM IS NOT WITH THE CONTROL
                                       ;       OR ADDRESS SIGNALS THEN ONE OF THE BIT SLICES IS AT FAULT.
                                       ;       THE BITS ARE PARTITIONED THUS:
                                       ;               BITS <07:00>    ON DCP
                                       ;               BITS <15:08>    ON DDP
                                       ;               BITS <31:16>    ON DEP
                                       ;       CAREFUL INSPECTION OF THE EXPECTED AND THE ACTUAL DATA RECIEVED
                                       ;       SHOULD IDENTIFY WHICH BIT SLICE FAILED.
                                       ;       IF THIS TEST FAILS AND THE PREVIOUS REGISTER TESTS PASS
                                       ;       THERE IS A VERY HIGH PROBABILITY THAT THE REGISTER CHIPS
                                       ;       THEMSELVES ARE THE CAUSE
                                       ;
                                       ; ERROR DESCRIPTION
                                       ;       DATA READ
                                       ;       ADDRESS FOR 1'S
                                       ;       ADDRESS OF 0'S
                                       ;       EXPECTED DATA
                                       ;
                                       ;--
                                       ;****************************************************************
                                       =0
U 127A, 0000,003D,0180,0800,0000,10CE  LABT1:  NEWTST
U 127B, 0000,003C,01F8,0800,0000,127C          Q_0
U 127C, 0000,003D,0180,0800,0000,1044  =0      CALL,J/RARB.Q              ; FILL RA AND RB WITH 0'S
U 127D, 0F00,003C,0180,0800,0000,127E          D_0
U 127E, 0000,003D,0180,0800,0000,11A6  =0      CALL,J/DC.NF               ; PUT -0F IN D.
U 127F, 0018,0038,1180,09F8,0000,1280          RC[0F]_K[.4]
                                       =0
U 1280, 0003,193D,0180,09D8,0000,1060  LABT1A: CALL,D3-0?,J/LTCHAB,RC[0B]_0    ; LATCH RA AND RB [D<3:0>]
U 1281, 0000,003C,0180,0800,0010,13A7          ALU_LA,CLK.UBCC
U 13A7, 0001,013C,0180,09E8,0000,1282          Z?,RC[0D]_D                ; IS RA 0?
```

```
U 1282, 0000,003D,0180,09F0,0000,1124   ;3365   =0      ERROR1,RC[OE]_LA
U 1283, 000C,0038,0180,0800,0010,13A8   ;3366           ALU_LB,CLK.UBCC
U 13A8, 0000,013C,0180,0800,0000,1284   ;3367           Z?                      ; IS RB 0?
U 1284, 000C,0039,0180,09E0,0000,1124   ;3368   =0      ERROR1,RC[OC]_LB
U 1285, 0000,003C,01F8,0800,0000,13A9   ;3369           Q_0
U 13A9, 0019,2000,05C0,0800,0000,1286   ;3370           Q_Q-K[.1]               ; Q=-1.
U 1286, 0001,393D,0180,09D8,0000,1030   ;3371   =0      CALL,D3-0?,J/WRRARB,RC[OB]_Q    ; MAKE RA RB -1
U 1287, 0000,003C,01E0,0800,0000,1288   ;3372           Q_D
U 1288, 0000,003D,0180,0800,0000,11A6   ;3373   =0      CALL,J/DC.NF            ; MAKE D=-0F
U 1289, 001D,2000,0180,0800,0010,13AA   ;3374   LABT1D: ALU_Q-D,CLK.UBCC
U 13AA, 0000,013C,0180,0800,0000,128A   ;3375           Z?
U 128A, 0C00,003C,01E0,0800,0000,128C   ;3376   =0      D_Q,Q_D,J/LABT1F
U 128B, 0000,003C,0180,0800,0000,13B1   ;3377           J7LABT1M
                                        ;3378   =0
U 128C, 0000,193D,0180,0800,0000,1060   ;3379   LABT1F: CALL,D3-C?,J/LTCHAB     ; READ -1'S
U 128D, 0018,0014,0580,0800,0010,13AB   ;3380           ALU_LA+K[.1],CLK.UBCC
U 13AB, 0001,213C,0180,09E0,0000,128E   ;3381           Z?,RC[OC!_Q             ; LA=-1?
U 128E, 0000,003D,0180,09F0,0000,1124   ;3382   =0      ERROR1,RC[OE]_LA
U 128F, 000C,0000,0180,0800,0010,13AC   ;3383           ALU_LA[A-B]LB,CLK.JBCC
U 13AC, 0000,013C,0180,0800,0000,1290   ;3384           Z?                      ; LB=-1?
U 1290, 000C,0039,0180,09F0,0000,1124   ;3385   =0      ERROR1,RC[OE]_LB
U 1291, 0C03,003C,01E0,09D8,0000,1292   ;3386           D_Q,Q_D,RC[OB]_0        ; EXCHANGE D AND Q.
U 1292, 0000,193D,0180,0800,0000,1060   ;3387   =0      CALL,D3-0?,J/LTCHAB     ; READ 0'S
U 1293, 0000,003C,0180,0800,0010,13AD   ;3388           ALU_LA,CLK.UBCC
U 13AD, 0000,013C,0180,0800,0000,1294   ;3389           Z?                      ; LA=0?
U 1294, 0000,003D,0180,09F0,0000,1124   ;3390   =0      ERROR1,RC[OE]_LA
U 1295, 000C,0038,0180,0800,0010,13AE   ;3391           ALU_LB,CLK.UBCC
U 13AE, 0000,013C,0180,0800,0000,1296   ;3392           Z?                      ; LB=0?
U 1296, 000C,0039,0180,09F0,0000,1124   ;3393   =0      ERROR1,RC[OE]_LB
U 1297, 0C1B,0000,05E0,09D8,0000,1298   ;3394           D_Q,Q_D,ALU_0-K[.1],RC[OB]_ALU  ; EXCHANGE D AND Q
U 1298, 0000,193D,0180,0800,0000,1060   ;3395   =0      CALL,D3-0?,J/LTCHAB     ; READ -1'S
U 1299, 0018,0014,0580,0800,0010,13AF   ;3396           ALU_LA+K[.1],CLK.UBCC
U 13AF, 0000,013C,0180,0800,0000,129A   ;3397           Z?                      ; LA=-1?
U 129A, 0000,003D,0180,09F0,0000,1124   ;3398   =0      ERROR1,RC[OE]_LA
U 129B, 000C,0000,0180,0800,0010,13B0   ;3399           ALU_LA[A-B]LB,CLK.UBCC
U 13B0, 0000,013C,0180,0800,0000,129C   ;3400           Z?                      ; LB=-1?
U 129C, 000C,0039,0180,09F0,0000,1124   ;3401   =0      ERROR1,RC[OE]_LB
U 129D, 0C00,003C,01E0,0800,0000,13B1   ;3402           D_Q,Q_D
U 13B1, 0819,0014,0580,0800,0010,13B2   ;3403   LABT1M: D_D+K[.1],CLK.UBCC
U 13B2, 0000,013C,0180,0800,0000,129E   ;3404           Z?
U 129E, 0000,003C,0180,0800,0000,1289   ;3405   =0      J/LABT1D
U 129F, 0C00,003C,01F8,0800,0000,12A0   ;3406           D_Q,Q_0
U 12A0, 0000,193D,0180,0800,0000,1030   ;3407   =0      CALL,D3-0?,J/WRRARB
U 12A1, 0819,0014,0580,0800,0010,13B3   ;3408           D_D+K[1],CLK.UBCC
U 13B3, 0000,013C,0180,0800,0000,12A2   ;3409           Z?
U 12A2, 0000,003C,0180,0800,0000,1280   ;3410   =0      J/LABT1A
U 12A3, 0000,003C,0180,0800,0000,12A4   ;3411           NOP
```

```
                                            .PAGE   "TEST 4D       GALLOP 0'S IN RA AND RB REGISTERS TEST"
                                    ;*************************************************************
                                    ;++
                                    ; TEST  4D      GALLOPING 0'S TEST OF RA AND RB REGISTERS
                                    ;
                                    ; TEST DESCRIPTION
                                    ;       THIS TEST PERFORMS A GALLOPPING 0'S TEST OF THE REGISTER
                                    ;       MEMORY CHIPS. FIRST ALL THE REGISTERS ARE SET TO FFFFFFFF. THEN
                                    ;       0 IS WRITTEN INTO R[0], R[0] IS READ AND CHECKED, R[1]
                                    ;       IS READ AND CHECK, R[0] IS READ AND CHECKED, R[2] IS READ AND
                                    ;       CHECKED, R[0] IS READ AND CHECKED, R[3] IS READ AND CHECKED, ETC.
                                    ;       THEN R[0] IS SET TO FFFFFFFF AND R[1] IS CLEARED, R[1] IS
                                    ;       READ AND CHECKED, R[0] IS READ AND CHECKED, R[1] IS READ
                                    ;       AND CHECKED, R[2] IS READ AND CHECKED, R[1] IS READ AND
                                    ;       CHECKED, R[3] IS READ AND CHECKED, ETC.
                                    ;
                                    ; LOGIC DESCRIPTION
                                    ;       THIS IS A TEST OF THE REGISTER CONTROL FIELD ON DAP
                                    ;       ALONG WITH THE REGISTER ADDRESS MUX'S. ALSO TESTED ARE
                                    ;       THE REGISTERS THEMSELVES AND THEIR INPUTS TO THE AMX AND BMX.
                                    ;       IF THE REGISTER ADDRESSES ARE INCORRECT THEN DAP IS MOST
                                    ;       LIKELY TO BE THE CAUSE. IF THE PROBLEM IS NOT WITH THE CONTROL
                                    ;       OR ADDRESS SIGNALS THEN ONE OF THE BIT SLICES IS AT FAULT.
                                    ;       THE BITS ARE PARTITIONED THUS:
                                    ;               BITS <07:00>    ON DCP
                                    ;               BITS <15:08>    ON DDP
                                    ;               BITS <31:16>    ON DEP
                                    ;       CAREFUL INSPECTION OF THE EXPECTED AND THE ACTUAL DATA RECIEVED
                                    ;       SHOULD IDENTIFY WHICH BIT SLICE FAILED.
                                    ;       IF THIS TEST FAILS AND THE PREVIOUS REGISTER TESTS PASS
                                    ;       THERE IS A VERY HIGH PROBABILITY THAT THE REGISTER CHIPS
                                    ;       THEMSELVES ARE THE CAUSE
                                    ;
                                    ; ERROR DESCRIPTION
                                    ;       DATA READ
                                    ;       ADDRESS FOR 0'S
                                    ;       ADDRESS OF 1'S
                                    ;       EXPECTED DATA
                                    ;--
                                    ;*************************************************************
                                    =0
U 12A4, 0000,003D,0180,0800,0000,10CE   LABT2:  NEWTST
U 12A5, 0000,003C,01F8,0800,0000,13B4           Q_0
U 13B4, 0019,2000,05C0,0800,0000,12A6           Q_Q-K[.1]               ; Q=-1
U 12A6, 0000,003D,0180,0800,0000,1044   =0      CALL,J/RARB.Q           ; FILL RA AND RB WITH -1'S
U 12A7, 0F00,003C,0180,0800,0000,12A8           D_0
U 12A8, 0000,003D,0180,0800,0000,11A6   =0      CALL,J/DC.NF            ; PUT -0F IN D.
U 12A9, 0018,0038,1180,09F8,0000,12AC           RC[0F]_K[.4]
                                        =0
U 12AC, 001B,1901,0580,09D8,0000,1060   LABT2A: CALL,D3-0?,J/LTCHAB,ALU_0-K[.1],RC[0B]_ALU
                                                                        ; LATCH RA AND RB [D<3:0>]
U 12AD, 0018,0014,0580,0800,0010,13B5           ALU_LA+K[.1],CLK.UBCC
U 13B5, 0001,013C,0180,09E8,0000,12AE           Z?,RC[0D]_D             ; IS RA -1?
U 12AE, 0000,003D,0180,09F0,0000,1124   =0      ERROR1,RC[0E]_LA
U 12AF, 000C,0000,0180,0800,0010,13B6           ALU_LA[A-B]LB,CLK.UBCC
```

```
U 13B6, 0000,013C,0180,0800,0000,12B0   ;3467             Z?                          ; IS RB -1?
U 12B0, 000C,0039,0180,09F0,0000,1124   ;3468   =0        ERROR1,RC[OE]_LB
U 12B1, 0003,003C,01F8,09D8,0000,12B2   ;3469             Q_0,RC[OB]_0
U 12B2, 0000,193D,0180,0800,0000,1030   ;3470   =0        CALL,D3-0?,J/WRRARB         ; MAKE RA AND RB 0
U 12B3, 0000,003C,01E0,0800,0000,12B4   ;3471             Q_D
U 12B4, 0000,003D,0180,0800,0000,11A6   ;3472   =0        CALL,J/DC.NF                ; MAKE D=-0F
U 12B5, 001D,2000,0180,0800,0010,13B7   ;3473   LABT2D:   ALU_Q-D,CLK.UBCC
U 13B7, 0000,013C,0180,0800,0000,12B6   ;3474             Z?
U 12B6, 0C00,003C,01E0,0800,0000,12B8   ;3475   =0        D_Q,Q_D,J/LABT2F
U 12B7, 0000,003C,0180,0800,0000,13BE   ;3476             J7LABT2M
                                        ;3477   =0
U 12B8, 0000,193D,0180,0800,0000,1060   ;3478   LABT2F:   CALL,D3-0?,J/LTCHAB         ; READ 0'S
U 12B9, 0000,003C,0180,0800,0010,13B8   ;3479             ALU_LA,CLK.UBCC
U 13B8, 0001,213C,0180,09E0,0000,12BA   ;3480             Z?,RC[0C]_Q                 ; LA=0?
U 12BA, 0000,003D,0180,09F0,0000,1124   ;3481   =0        ERROR1,RC[OE]_LA
U 12BB, 000C,0038,0180,0800,0010,13B9   ;3482             ALU_LB,CLK.UBCC
U 13B9, 0000,013C,0180,0800,0000,12BC   ;3483             Z?                          ; LB=0?
U 12BC, 000C,0039,0180,09F0,0000,1124   ;3484   =0        ERROR1,RC[OE]_LB
U 12BD, 0C1B,0000,05E0,09D8,0000,12BE   ;3485             D_Q,Q_D,ALU_0-K[.1],RC[OB]_ALU
U 12BE, 0000,193D,0180,0800,0000,1060   ;3486   =0        CALL,D3-0?,J/LTCHAB         ; READ -1'S
U 12BF, 0018,0014,0580,0800,0010,13BA   ;3487             ALU_LA+K[.1],CLK.UBCC
U 13BA, 0000,013C,0180,0800,0000,12C0   ;3488             Z?                          ; LA=-1?
U 12C0, 0000,003D,0180,09F0,0000,1124   ;3489   =0        ERROR1,RC[OE]_LA
U 12C1, 000C,0000,0180,0800,0010,13BB   ;3490             ALU_LA[A-B]LB,CLK.UBCC
U 13BB, 0000,013C,0180,0800,0000,12C2   ;3491             Z?                          ; LB=-1?
U 12C2, 000C,0039,0180,09F0,0000,1124   ;3492   =0        ERROR1,RC[OE]_LB
U 12C3, 0C03,003C,01E0,09D8,0000,12C4   ;3493             D_Q,Q_D,RC[OB]_0
U 12C4, 0000,193D,0180,0800,0000,1060   ;3494   =0        CALL,D3-0?,J/LTCHAB         ; READ 0'S
U 12C5, 0000,003C,0180,0800,0010,13BC   ;3495             ALU_LA,CLK.UBCC
U 13BC, 0000,013C,0180,0800,0000,12C6   ;3496             Z?                          ; LA=0?
U 12C6, 0000,003D,0180,09F0,0000,1124   ;3497   =0        ERROR1,RC[OE]_LA
U 12C7, 000C,0038,0180,0800,0010,13BD   ;3498             ALU_LB,CLK.UBCC
U 13BD, 0000,013C,0180,0800,0000,12C8   ;3499             Z?
U 12C8, 000C,0039,0180,09F0,0000,1124   ;3500   =0        ERROR1,RC[OE]_LB
U 12C9, 0C00,003C,01E0,0800,0000,13BE   ;3501             D_Q,Q_D
U 13BE, 0819,0014,0580,0800,0010,13BF   ;3502   LABT2M:   D_D+K[.1],CLK.UBCC
U 13BF, 0000,013C,0180,0800,0000,12CA   ;3503             Z?
U 12CA, 0000,003C,0180,0800,0000,12B5   ;3504   =0        J/LABT2D
U 12CB, 0C00,003C,01E0,0800,0000,13C0   ;3505             D_Q,Q_D
U 13C0, 0000,003C,01F8,0800,0000,13C1   ;3506             Q_0
U 13C1, 0019,2000,05C0,0800,0000,12CC   ;3507             Q_Q-K[.1]
U 12CC, 0000,193D,0180,0800,0000,1030   ;3508   =0        CALL,D3-0?,J/WRRARB
U 12CD, 0819,0014,0580,0800,0010,13C2   ;3509             D_D+K[.1],CLK.UBCC
U 13C2, 0000,013C,0180,0800,0000,12CE   ;3510             Z?
U 12CE, 0000,003C,0180,0800,0000,12AC   ;3511   =0        J/LABT2A
U 12CF, 0000,003C,0180,0800,0000,13C3   ;3512             NOP
                                        ;3513
                                        ;3514   ;//////////////////////////////////////////////////////////////////////
                                        ;3515   ;+        THIS ROUTINE HAS NOTHING WHATSOEVER TO DO WITH THE ABOVE TEST.
                                        ;3516   ;         FIRST, THE SYSTEM ID REGISTER IS READ AND THE CONTENTS TYPE TO
                                        ;3517   ;         THE CONSOLE TERMINAL. THEN, A JUMP IS MADE TO LOCATION 85(X) IN
                                        ;3518   ;         PCS WHICH IS ECO'D TO BE EITHER 1180(X) IF THE KE780 OPTION IS
                                        ;3519   ;         NOT PRESENT OR 11A3(X) IF IT IS PRESENT.
                                        ;3520   ;
                                        ;3521   ;& 1,/SYSTEM ID REGISTER = /
```

```
                                                 ;& 2./KE780 FPLA NOT PRESENT/
                                                 ;& 3./KE780 FPLA PRESENT/
                                                 ;-
U 13C3, 0000,003C,0DF0,2C00,0000,13C4                    Q_ID[SYS.ID]
U 13C4, 0001,203C,0180,09F0,0000,12D0                    RC[0E]_Q
U 12D0, 0000,003D,0180,0800,0000,1146            =0      CALL[DECFLG]              ; DECREMENT THE TYPE OUT FLAG
U 12D1, 0000,003C,0180,0800,0000,12D2                    NOP
U 12D2, 0818,0039,0580,0800,0000,11B6            =0      TYPE_MSG_1                ; "SYS ID REGISTER = "
U 12D3, 0000,003C,0180,0800,0000,12D4                    NOP
U 12D4, 0000,003D,0180,0800,0000,1146            =0      CALL[DECFLG]              ; DECREMENT THE TYPEOUT FLAG
U 12D5, 0000,003C,0180,0800,0000,12D6                    NOP
U 12D6, 0000,003D,0180,0800,0000,11D6            =0      TYP_RC[0E]_CRLF

U 12D7, 0000,003C,0180,0800,0000,12D8                    NOP
U 12D8, 0000,003D,0980,0800,0084,713C            =0      SETRCF[.2]                ; SET NUMBER OF TYPEOUT ARGUMENTS
                                                    ;
                                                    ; CHECK IF KE780 OPTION IS PRESENT
                                                    ;
U 12D9, 0000,003C,0180,0800,0000,0085                    J/85                      ; SEE IF KE780 FPLA IS INSTALLED
U 1180, 0000,003D,0180,0800,0000,1146            1180:   CALL[DECFLG]              ; DECREMENT TYPEOUT FLAG
U 1181, 0000,003C,0180,0800,0000,12DA            1181:   NOP
U 12DA, 0818,0039,0980,0800,0000,11DC            =0      TYP_MSG_2_CRLF            ; TELL OPERATOR KE780 IS NOT PRESENT
U 12DB, 0000,003C,0180,0800,0000,13CA                    J/ESKAH20_END
U 11A3, 0000,003C,0180,0800,0000,12DC            11A3:   NOP
U 12DC, 0000,003D,0180,0800,0000,1146            =0      CALL[DECFLG]              ; DECREMENT TYPEOUT FLAG
U 12DD, 0000,003C,0180,0800,0000,12DE                    NOP
U 12DE, 0818,0039,0D80,0800,0000,11DC            =0      TYP_MSG_3_CRLF            ; TELL OPERATOR KE780 IS PRESENT
                                                    ;
                                                    ; NOW CHECK THAT THE SYSTEM ID REGISTER REFLECTS A PROPER ECO
                                                    ; LEVEL. THE ECO LEVEL MUST BE AT LEAST 70
                                                    ;
U 12DF, 0000,003C,0DF0,2C00,0000,13C5                    Q_ID[SYS.ID]              ; GET SYSTEM ID REGISTER
U 13C5, 0C00,003C,6180,0800,0000,13C6                    D_Q,K[.F]                 ; SETUP TO SHIFT ECO LEVEL FIELD
U 13C6, 001B,0000,6180,0800,0082,13C7                    SC_0-K[.F]                ; ...
U 13C7, 0D00,003C,0180,0800,0000,12E0                    D_DAL.SC                  ; SHIFT TO BITS<8:0>
U 12E0, 0818,0039,8DE0,0800,0000,101F            =0      Q_D,D_K[.1F],CALL[DCF]    ; GET A MASK
U 12E1, 001D,0034,01C0,09E8,0000,12E2                    Q_D[AND]Q,RC[0D]_ALU      ; GET SYSTEM ECO LEVEL
U 12E2, 0818,0039,5D80,0800,0000,1010            =0      D_K[.7],CALL[DC0]         ; GET MINIMUM ECO LEVEL
U 12E3, 0001,003C,0180,09F0,0000,13C8                    RC[0E]_D                  ; SAVE FOR TYPEOUT
U 13C8, 001D,2000,0180,0800,0010,13C9                    ALU_Q-D,CLK.UBCC          ; IS ECO AT LEAST AT MINIMUM?
U 13C9, 0000,1B3C,0180,0800,0000,1047                    ALU.N?
U 1047, 0000,003C,0180,0800,0000,13CA            =0111   J/ESKAH20_END             ; SYSTEM ECO LEVEL OK
U 104F, 0000,003C,0180,0800,0000,12E4                    NOP
U 12E4, 0000,003D,0180,0800,0000,112C            =0      ERROR2                    ; SYSTEM ECO LEVEL TOO LOW
U 12E5, 0000,003C,0180,0800,0000,13CA                    NOP

                                                 ESKAH20_END:
U 13CA, 0000,003D,0180,0800,0000,10CE            DUM:    NEWTST
```

```
;                               Location / Line Number Index

;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000           1872:    1839     1846=    1862=    1863=    1864=    1840     2089=
U 1008           2415=    2416=    2418=    1841     2017=    2018=    1842     2090=
U 1010           1959=    1960=    1961=    1962=    1963=    1964=    1965=    1966=
U 1018           1967=    1968=    1969=    1970=    1971=    1972=    1973=    1974=
U 1020           2000=    2001=    2002=    2003=    2004=    2005=    2006=    2007=
U 1028           2008=    2009=    2010=    2011=    2012=    2013=    2014=    2015=
U 1030           2021=    2022=    2023=    2024=    2025=    2026=    2027=    2028=
U 1038           2029=    2030=    2031=    2032=    2033=    2034=    2035=    2036=
U 1040           2440=    2441=    2442=    1843     2059=    2060=    1844     3563=
U 1048           2464=    2465=    2466=    1845     2062=    2063=    1901:    3564=
U 1050           2488=    2489=    2490=    1865     1866     2154=    1867     2155=
U 1058           2065=    2066=    1904:    1868     1869     2172=    1907:    2173=
U 1060           2040=    2041=    2042=    2043=    2044=    2045=    2046=    2047=
U 1068           2048=    2049=    2050=    2051=    2052=    2053=    2054=    2055=
U 1070           2512=    2513=    2514=    1870     2140=    2141=    2175=    2176=
U 1078           2148=    2149=    2150=    2151=    2165=    2166=    2202=    2203=
U 1080           2167=    2168=    2180=    2181=    2190=    2191=    2198=    2200=
U 1088           2192=    2193=    2213=    2214=    2215=    2216=    2218=    2219=
U 1090           2237=    2238=    2239=    2240=    2244=    2245=    2223=    2224=
U 1098           2248=    2249=    2257=    2258=    2259=    2260=    2228=    2229=
U 10A0           2264=    2266=    2270=    2272=    2276=    2277=    2311=    2312=
U 10A8           2299=    2300=    2304=    2305=    2306=    2307=    2314=    2315=
U 10B0           2349=    2350=    2353=    2354=    2355=    2357=    2317=    2318=
U 10B8           2362=    2363=    2364=    2366=    2371=    2372=    2320=    2321=
U 10C0           2393=    2394=    2408=    2409=    2410=    2411=    2323=    2324=
U 10C8           2412=    2413=    2432=    2433=    1871     2540=    1881     2541=
U 10D0           2434=    2435=    2436=    2437=    1882     2542=    1883     2543=
U 10D8           2438=    2439=    2456=    2457=    1884     2544=    1885     2545=
U 10E0           2458=    2459=    2460=    2461=    1886     2546=    1887     2547=
U 10E8           2462=    2463=    2480=    2481=    1888     2548=    1889     2549=
U 10F0           2482=    2483=    2484=    2485=    1890     2550=    1891     2551=
U 10F8           2486=    2487=    2504=    2505=    1892     2552=    1893     2553=
U 1100           1826:    1827:    1828:    1829:    1830:    1831:    1832:    1833:
U 1108           1834:    1894     2506=    2507=    1835:    1836:    1837:    1838:
U 1110           2508=    2509=    2510=    2511=    1895     2554=    1896     2555=
U 1118           2535=    2536=    2642=    2643=    1897     2556=    1898     2557=
U 1120           2650=    2651=    2652=    2653=    1899     2558=    1900     2559=
U 1128           2657=    2658=    2667=    2668=    1902     2560=    1903     2561=
U 1130           2669=    2670=    2671=    2672=    1935     2562=    1936     2563=
U 1138           2687=    2688=    2689=    2690=    1942     2564=    1943     2565=
U 1140           2696=    2697=    2704=    2705=    1944     2566=    1949     2567=
U 1148           2706=    2707=    2714=    2715=    1950     2568=    1951     2569=
U 1150           2722=    2723=    1954     2659=    1955     1927:    1956     2660=
U 1158           2724=    2725=    2732=    2733=    1957     2570=    1975     2571=
U 1160           2740=    2741=    2742=    2743=    1976     2572=    1977     2573=
U 1168           2750=    2751=    2758=    2759=    1978     2574=    1979     2575=
U 1170           2760=    2761=    2768=    2769=    1980     2576=    1981     2577=
U 1178           2776=    2777=    2778=    2779=    1982     2578=    1983     2579=
U 1180           3541:    3542:    2786=    2787=    1984     2580=    1985     2581=
U 1188           2794=    2795=    2796=    2797=    1986     2582=    1987     2583=
U 1190           2807=    2808=    2815=    2816=    1988     2584=    1989     2585=
U 1198           2817=    2818=    2827=    2828=    1990     2586=    1991     2587=
;Location          0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0             2861=   2862=   1992    3545:   1993    2588=   1994    2589=
U 11A8             2863=   2864=   2865=   2866=   1995    2590=   2016    2591=
U 11B0             2874=   2875=   2880=   2881=   2064    2592=   2081    2593=
U 11B8             2887=   2888=   2893=   2894=   2083    2594=   2084    2595=
U 11C0             2900=   2901=   2906=   2907=   2085    2596=   2086    2597=
U 11C8             2940=   2941=   2942=   2943=   2087    2598=   2088    2599=
U 11D0             2944=   2945=   2950=   2951=   2091    2600=   2094    2601=
U 11D8             2956=   2957=   2963=   2964=   2096    2602=   2097    2603=
U 11E0             2969=   2970=   2975=   2976=   2152    2604=   2169    2605=
U 11E8             2982=   2983=   2170    2676=   3015=   3016=   2171    2677=
U 11F0             3017=   3018=   3019=   3020=   3021=   3022=   3025=   3026=
U 11F8             3027=   3028=   3030=   3031=   3033=   3034=   3036=   3038=
U 1200             3040=   3041=   3073=   3074=   3076=   3077=   3078=   3079=
U 1208             3080=   3081=   3086=   3087=   3088=   3089=   3091=   3092=
U 1210             3094=   3095=   3097=   3099=   3102=   3103=   3142=   3143=
U 1218             3145=   3146=   3147=   3148=   3149=   3150=   3151=   3152=
U 1220             3153=   3154=   3155=   3156=   3157=   3158=   3159=   3160=
U 1228             3161=   3163=   3165=   3166=   3167=   3168=   3170=   3171=
U 1230             3172=   3173=   3174=   3175=   3176=   3177=   3178=   3179=
U 1238             3180=   3181=   3182=   3183=   3184=   3185=   3186=   3187=
U 1240             3189=   3190=   3196=   3197=   3203=   3204=   3243=   3244=
U 1248             3245=   3246=   3248=   3249=   3250=   3251=   3252=   3253=
U 1250             3254=   3255=   3256=   3257=   3258=   3259=   3260=   3261=
U 1258             3262=   3263=   3264=   3266=   3268=   3269=   3270=   3271=
U 1260             3272=   3273=   3275=   3276=   3277=   3278=   3279=   3280=
U 1268             3281=   3282=   3283=   3284=   3285=   3286=   3287=   3288=
U 1270             3289=   3290=   3291=   3292=   3294=   3295=   3301=   3302=
U 1278             3308=   3309=   3355=   3356=   3357=   3358=   3359=   3360=
U 1280             3362=   3363=   3365=   3366=   3368=   3369=   3371=   3372=
U 1288             3373=   3374=   3376=   3377=   3379=   3380=   3382=   3383=
U 1290             3385=   3386=   3387=   3388=   3390=   3391=   3393=   3394=
U 1298             3395=   3396=   3398=   3399=   3401=   3402=   3405=   3406=
U 12A0             3407=   3408=   3410=   3411=   3453=   3454=   3456=   3457=
U 12A8             3458=   3459=   1928:   2174    3461=   3463=   3465=   3466=
U 12B0             3468=   3469=   3470=   3471=   3472=   3473=   3475=   3476=
U 12B8             3478=   3479=   3481=   3482=   3484=   3485=   3486=   3487=
U 12C0             3489=   3490=   3492=   3493=   3494=   3495=   3497=   3498=
U 12C8             3500=   3501=   3504=   3505=   3508=   3509=   3511=   3512=
U 12D0             3527=   3528=   3529=   3530=   3531=   3532=   3533=   3535=
U 12D8             3536=   3540=   3543=   3544=   3546=   3547=   3548=   3553=
U 12E0             3557=   3558=   3559=   3560=   3565=   3566=   2178    2179
U 12E8             2194    2195    2196    2197    2201    2205    2217    2220
U 12F0             2221    2222    2225    2226    2227    2241    2242    2243
U 12F8             2246    2247    2261    2262    2263    2267    2268    2269
U 1300             2273    2274    2275    2308    2310    2313    2316    2319
U 1308             2322    2358    2369    2370    2414    2537    2538    2539
U 1310             2606    2654    2655    2656    2673    2674    2675    2691
U 1318             2692    2693    2694    2695    2708    2709    2710    2711
U 1320             2712    2713    2726    2727    2728    2729    2730    2731
U 1328             2744    2746    2747    2748    2749    2762    2763    2764
U 1330             2765    2766    2767    2780    2781    2782    2783    2784
U 1338             2785    2798    2799    2800    2802    2803    2804    2805
U 1340             2806    2819    2820    2821    2822    2823    2824    2825
```

```
;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 1348           2826     2867     2868     2869     2870     2871     2872     2873
U 1350           2876     2877     2878     2879     2882     2883     2884     2885
U 1358           2886     2889     2890     2891     2892     2895     2896     2897
U 1360           2898     2899     2902     2903     2904     2905     2946     2947
U 1368           2948     2949     2952     2953     2954     2955     2958     2959
U 1370           2960     2961     2962     2965     2966     2967     2968     2971
U 1378           2972     2973     2974     2977     2978     2979     2980     2981
U 1380           3023     3024     3029     3032     3035     3039     3075     3082
U 1388           3083     3084     3085     3090     3093     3096     3100     3164
U 1390           3188     3191     3192     3193     3194     3195     3198     3199
U 1398           3200     3201     3202     3267     3293     3296     3297     3298
U 13A0           3299     3300     3303     3304     3305     3306     3307     3364
U 13A8           3367     3370     3375     3381     3384     3389     3392     3397
U 13B0           3400     3403     3404     3409     3455     3464     3467     3474
U 13B8           3480     3483     3488     3491     3496     3499     3502     3503
U 13C0           3506     3507     3510     3525     3526     3554     3555     3556
U 13C8           3561     3562     3569
U 13D0 - 13EF Unused
U 13F0           1911:    1912:    1913:    1914:    1915:    1916:    1917:    1918:
U 13F8           1919:    1920:    1921:    1922:    1923:    1924:    1925:    1926:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKA4MAC          0
  ESKAH20        987

Used             987
Remaining

Total microwords used in memory U: 987
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH20.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 1806  MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2040  TEST 4E FLOAT 1 THROUGH 0'S IN RC REGISTERS TEST
; 2099  TEST 4F FLOAT 0 THROUGH 1'S IN RC REGISTERS TEST
; 2160  TEST 50 RC REGISTERS FOREWARD DUAL ADDRESSING TEST
; 2255  TEST 51 RC REGISTERS BACKWARD DUAL ADDRESSING TEST
; 2354  TEST 52 GALLOP 1'S IN RC REGISTERS TEST
; 2454  TEST 53 GALLOP 0'S IN RC REGISTERS TEST
; 2555  TEST 54 NIBBLE SWAP D, FLOAT 1 ACROSS 0'S, TEST
; 2661  TEST 55 NIBBLE SWAP D, FLOAT 0 ACROSS 1'S, TEST
; 2776  TEST 56 TEST USI, SHIFT INPUT, USING THE Q REGISTER
; 3013  TEST 57 TEST USI, SHIFT INPUT, USING THE D REGISTER
; 3253  TEST 58 AMX TEST
```

```
;1          .NOLIST
;1804       .LIST
;1805
```

```
                                          .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                  .REGION/1000,13FF
                                  ;+
                                  ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                  ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                  ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                  ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                  ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                  ;
                                  ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                  ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                  ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                  ;       R[OF] AND DO A RETURNO.
                                  ;
                                  ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                  ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                  ; TO THE CONSOLE.
                                  ;
                                  ;-
U 1100, 0000,003C,1980,0800,0084,7003   1100:   SC_K[ZERO],J/TRPH1      ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001   1101:   SC_K[.1],J/TRPHO        ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001   1102:   SC_K[.2],J/TRPHO        ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001   1103:   SC_K[.3],J/TRPHO        ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001   1104:   SC_K[.4],J/TRPHO        ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001   1105:   SC_K[.6],J/TRPHO        ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001   1106:   SC_K[.9],J/TRPHO        ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001   1107:   SC_K[.7],J/TRPHO        ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001   1108:   SC_K[.8],J/TRPHO        ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003   110C:   SC_K[.C],J/TRPH1        ; RDS
U 110D, 0000,003C,8980,0800,0084,7003   110D:   SC_K[.D],J/TRPH1        ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001   110E:   SC_K[.10],J/TRPHO       ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003   110F:   SC_K[.F],J/TRPH1        ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,1004   TRPHO:  Q_ID[USTACK]
U 1004, 0C00,003C,01E0,0800,0000,1006           Q_D,D_Q
U 1006, 0000,003C,8180,3C00,0000,100C           ID[USTACK]_D
U 100C, 0C00,003C,01E0,0800,0000,100E           Q_D,D_Q
U 100E, 0000,003C,01C0,0A78,0000,104C           Q_R[OF]
U 104C, 0001,2024,0180,0800,0010,105B           ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 105B, 0000,013C,0180,0800,0000,1002           Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000   =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN
                                  ;+
                                  ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                  ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                  ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                  ;
                                  ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                  ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                  ;             FAULT STATUS REGISTER
                                  ;             SBI ERROR REGISTER
                                  ;             TIMEOUT ADDRESS REGISTER
                                  ;             MAINTENANCE REGISTER
                                  ;             CACHE PARITY REGISTER
                                  ;             TB ERROR REGISTER 1
                                  ;             TB ERROR REGISTER 0
                                  ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,1008     TRPH1:  RC[0D]_SC
U 1008, 0000,003D,D980,0800,0084,7280     =0      SETRCF[.9]
U 1009, 0000,003C,49F0,2C00,0000,105C             Q_ID[TBER0]
U 105C, 0001,203C,4DF0,2DB0,0000,1064             RC[6]_Q,Q_ID[TBER1]
U 1064, 0001,203C,65F0,2DB8,0000,1066             RC[7]_Q,Q_ID[SBI.ERR]
U 1066, 0001,203C,6DF0,2DD8,0000,106C             RC[0B]_Q,Q_ID[FAULT]
U 106C, 0001,203C,75F0,2DE0,0000,106E             RC[0C]_Q,Q_ID[MAINT]
U 106E, 0001,203C,79F0,2DC8,0000,1109             RC[9]_Q,Q_ID[PARITY]
U 1109, 0001,203C,69F0,2DC0,0000,1154             RC[8]_Q,Q_ID[TIME.ADDR]
U 1154, 0001,203C,81F0,2DD0,0000,1000             RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,127A     1000:   RC[0E]_Q,ERROR1
                                          ;+
                                          ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                          ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                          ;                 NEWTST
                                          ;                 ERLOOP
                                          ;                 ERROR1
                                          ;                 ERROR2
                                          ;
U 1268, 0000,003C,65F8,0800,0084,7269     SCOPE:  SC_K[.10],Q_0                ; SETUP TO WRITE IPL OF 1F
U 1269, 0818,0038,8D80,0800,0000,126A             D_K[.1F]                     ; ...
U 126A, 0D00,003C,0180,0800,0000,126B             D_DAL.SC
U 126B, 0000,003C,3D80,3C00,0000,126C             ID[PSL]_D                    ; WRITE THE PSL
U 126C, 0818,0038,0580,0800,0000,126D             D_K[.1]                      ; SETUP TO CLEAR THE CES REGISTER
U 126D, 0D00,003C,0180,0800,0000,126E             D_DAL.SC
U 126E, 0F00,003C,3180,3C00,0000,126F             ID[CES]_D,D_0                ; CLEAR THE CES REGISTER
U 126F, 0000,003C,5D80,3C00,0000,1270             ID[ACC.CS]_D                 ; SHUT OFF THE FLOATING POINT
U 1270, 0000,003C,3980,3C00,0000,1271             ID[SIR]_D                    ; CLEAR THE SIR REGISTER
U 1271, 0000,003C,2980,3C00,0000,1272             ID[CLK.CS]_D                 ; STOP INTERVAL TIMER
U 1272, 0000,003C,4980,3C00,0000,1273             ID[TBER0]_D                  ; SHUT OFF THE TB
U 1273, 0818,0038,C180,0800,0000,1274             D_K[.FFFF]
U 1274, 0000,003C,6580,3C00,0000,1275             ID[SBI.ERR]_D
U 1275, 0F00,003C,6D80,3C00,0000,1276             ID[FAULT]_D,D_0
U 1276, 0000,003C,6D80,3C00,0000,1277             ID[FAULT]_D
U 1277, 0000,003C,6580,3C00,0000,1278             ID[SBI.ERR]_D
U 1278, 0003,003C,0180,0AF8,0000,105E             R[0F]_0,J/CALLCON            ; CALL THE CONSOLE
U 1279, 0818,0038,0980,0800,0000,105E     ERLOOP: D_K[.2],J/CALLCON            ; ERRLOOP CALL
U 127A, 0810,0038,0180,0978,0000,127B     ERROR1: D_RC[0F]
U 127B, 0819,0034,4D80,0800,0000,104E             D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E     104E:   D_D.OR.K[.4],J/CALLCON
U 127C, 0810,0038,0180,0978,0000,127D     ERROR2: D_RC[0F]
U 127D, 0819,0034,4D80,0800,0000,105A             D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E     105A:   D_D.OR.K[.6],J/CALLCON
                                          105E:
                                          CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E             ID[TXDB]_D,J/CALLCON         ; CALL THE CONSOLE
                                          ;+
                                          ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                          ;-
U 13F0, 0000,003C,0180,0800,0000,13F1     13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2     13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3     13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4     13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5     13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6     13F5:   NOP
```

```
U 13F6, 0000,003C,0180,0800,0000,13F7      13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8      13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9      13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA      13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB      13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC      13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD      13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE      13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF      13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155      13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA      1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,127E      12AA:   NOP
                                           ;+
                                           ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                           ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                           ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                           ; TYPING IT.
                                           ;-
U 127E, 0810,0038,4D80,0978,0000,127F      SUBTST: D_RC[OF],KMX/.FF00
U 127F, 0019,4016,4D80,09F8,0000,0001              RC[OF]_D+K[.FF00],WORD,RETURN1
                                           ;+
                                           ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                           ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                           ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                           ;-
U 1280, 0010,0038,01C0,0978,0000,1281      SETRCF: Q_RC[OF]
U 1281, 0019,2034,4DC0,0800,0000,1282              Q_Q.AND.K[.FF00]
U 1282, 0019,2032,1D80,09F8,0000,0001              RC[OF]_Q.OR.SC,RETURN1

                                           ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 1283, 0118,0038,1B80,0800,0000,1287      S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 1284, 0118,0038,0B80,0800,0000,1287      S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1285, 0118,0038,0780,0800,0000,1287      S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 1286, 0118,0038,C380,0800,0000,1287      S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
                                           =0000
U 1010, 0018,0038,1980,0800,0000,1283      DC0:    ALU_0(K),J/S00
U 1011, 0018,0038,1980,0800,0000,1284      DC1:    ALU_0(K),J/S01
U 1012, 0018,0038,1980,0800,0000,1285      DC2:    ALU_0(K),J/S10
U 1013, 0018,0038,1980,0800,0000,1286      DC3:    ALU_0(K),J/S11
U 1014, 0018,0038,0980,0800,0000,1283      DC4:    ALU_K[.2],J/S00
U 1015, 0018,0038,0980,0800,0000,1284      DC5:    ALU_K[.2],J/S01
U 1016, 0018,0038,0980,0800,0000,1285      DC6:    ALU_K[.2],J/S10
U 1017, 0018,0038,0980,0800,0000,1286      DC7:    ALU_K[.2],J/S11
U 1018, 0018,0038,0580,0800,0000,1283      DC8:    ALU_K[.1],J/S00
U 1019, 0018,0038,0580,0800,0000,1284      DC9:    ALU_K[.1],J/S01
U 101A, 0018,0038,0580,0800,0000,1285      DCA:    ALU_K[.1],J/S10
U 101B, 0018,0038,0580,0800,0000,1286      DCB:    ALU_K[.1],J/S11
U 101C, 0018,0038,C180,0800,0000,1283      DCC:    ALU_K[.FFFF],J/S00
U 101D, 0018,0038,C180,0800,0000,1284      DCD:    ALU_K[.FFFF],J/S01
U 101E, 0018,0038,C180,0800,0000,1285      DCE:    ALU_K[.FFFF],J/S10
U 101F, 0018,0038,C180,0800,0000,1286      DCF:    ALU_K[.FFFF],J/S11
U 1287, 0100,003E,0380,0800,0000,0001      SX:     D_D.LEFT2,SI/7,RETURN1
U 1288, 0F00,003C,0180,0800,0000,1289      DC.NF:  D_0
U 1289, 0819,0000,0580,0800,0000,1010              D_D-K[.1],J/DC0
                                           ; THESE SUBROUTINES ARE USED TO SHIFT ZEROES INTO THE Q REGISTER.
```

```
                                          ;1971    =0
U 100A, 0000,003D,0180,0800,0000,100B     ;1972    SHQLFT16:       CALL,J/SHQLFT8
U 100B, 0000,003C,01A8,0800,0000,128A     ;1973    SHQLFT8:        Q_Q.LEFT,SI/3
U 128A, 0000,003C,01A8,0800,0000,128B     ;1974    SHQLFT7:        Q_Q.LEFT,SI/3
U 128B, 0000,003C,01A8,0800,0000,128C     ;1975            Q_Q.LEFT,SI/3
U 128C, 0000,003C,01A8,0800,0000,128D     ;1976            Q_Q.LEFT,SI/3
U 128D, 0000,003C,01A8,0800,0000,128E     ;1977            Q_Q.LEFT,SI/3
U 128E, 0000,003C,01A8,0800,0000,128F     ;1978            Q_Q.LEFT,SI/3
U 128F, 0000,003C,01A8,0800,0000,1290     ;1979            Q_Q.LEFT,SI/3
U 1290, 0000,003E,01A8,0800,0000,0001     ;1980            Q_Q.LEFT,SI/3,RETURN1
                                          ;1981    ; THESE SUBROUTINES ARE USED TO SHIFT 1'S INTO THE Q REGISTE.
                                          ;1982    =0
U 1040, 0000,003D,0180,0800,0000,1291     ;1983    SHQL16: CALL,J/SHQL8
U 1041, 0000,003C,0180,0800,0000,1291     ;1984            J/SHQL8
U 1291, 0000,003C,03A8,0800,0000,1292     ;1985    SHQL8:  Q_Q.LEFT,SI/7
U 1292, 0000,003C,03A8,0800,0000,1293     ;1986    SHQL7:  Q_Q.LEFT,SI/7
U 1293, 0000,003C,03A8,0800,0000,1294     ;1987            Q_Q.LEFT,SI/7
U 1294, 0000,003C,03A8,0800,0000,1295     ;1988            Q_Q.LEFT,SI/7
U 1295, 0000,003C,03A8,0800,0000,1296     ;1989            Q_Q.LEFT,SI/7
U 1296, 0000,003C,03A8,0800,0000,1297     ;1990            Q_Q.LEFT,SI/7
U 1297, 0000,003C,03A8,0800,0000,1298     ;1991            Q_Q.LEFT,SI/7
U 1298, 0000,003E,03A8,0800,0000,0001     ;1992            Q_Q.LEFT,SI/7,RETURN1
                                          ;1993    ; THESE TABLES ARE USED TO WRITE Q INTO THE RC SCRATCH PADS.
                                          ;1994    =0000
U 1020, 0001,203E,0180,0980,0000,0001     ;1995    WRRC:   RC[0]_Q,RETURN1
U 1021, 0001,203E,0180,0988,0000,0001     ;1996            RC[1]_Q,RETURN1
U 1022, 0001,203E,0180,0990,0000,0001     ;1997            RC[2]_Q,RETURN1
U 1023, 0001,203E,0180,0998,0000,0001     ;1998            RC[3]_Q,RETURN1
U 1024, 0001,203E,0180,09A0,0000,0001     ;1999            RC[4]_Q,RETURN1
U 1025, 0001,203E,0180,09A8,0000,0001     ;2000            RC[5]_Q,RETURN1
U 1026, 0001,203E,0180,09B0,0000,0001     ;2001            RC[6]_Q,RETURN1
U 1027, 0001,203E,0180,09B8,0000,0001     ;2002            RC[7]_Q,RETURN1
U 1028, 0001,203E,0180,09C0,0000,0001     ;2003            RC[8]_Q,RETURN1
U 1029, 0001,203E,0180,09C8,0000,0001     ;2004            RC[9]_Q,RETURN1
U 102A, 0001,203E,0180,09D0,0000,0001     ;2005            RC[0A]_Q,RETURN1
U 102B, 0001,203E,0180,09D8,0000,0001     ;2006            RC[0B]_Q,RETURN1
U 102C, 0001,203E,0180,09E0,0000,0001     ;2007            RC[0C]_Q,RETURN1
U 102D, 0001,203E,0180,09E8,0000,0001     ;2008            RC[0D]_Q,RETURN1
U 102E, 0001,203E,0180,09F0,0000,0001     ;2009            RC[0E]_Q,RETURN1
U 102F, 0001,203E,0180,09F8,0000,0001     ;2010            RC[0F]_Q,RETURN1
                                          ;2011    ; THESE ARE USED TO READ THE RC SCRATCH PADS INTO LC.
                                          ;2012    =0000
U 1030, 0000,003E,0180,0900,0000,0001     ;2013    LTCHRC: LC_RC[0],RETURN1
U 1031, 0000,003E,0180,0908,0000,0001     ;2014            LC_RC[1],RETURN1
U 1032, 0000,003E,0180,0910,0000,0001     ;2015            LC_RC[2],RETURN1
U 1033, 0000,003E,0180,0918,0000,0001     ;2016            LC_RC[3],RETURN1
U 1034, 0000,003E,0180,0920,0000,0001     ;2017            LC_RC[4],RETURN1
U 1035, 0000,003E,0180,0928,0000,0001     ;2018            LC_RC[5],RETURN1
U 1036, 0000,003E,0180,0930,0000,0001     ;2019            LC_RC[6],RETURN1
U 1037, 0000,003E,0180,0938,0000,0001     ;2020            LC_RC[7],RETURN1
U 1038, 0000,003E,0180,0940,0000,0001     ;2021            LC_RC[8],RETURN1
U 1039, 0000,003E,0180,0948,0000,0001     ;2022            LC_RC[9],RETURN1
U 103A, 0000,003E,0180,0950,0000,0001     ;2023            LC_RC[0A],RETURN1
U 103B, 0000,003E,0180,0958,0000,0001     ;2024            LC_RC[0B],RETURN1
U 103C, 0000,003E,0180,0960,0000,0001     ;2025            LC_RC[0C],RETURN1
```

```
U 103D, 0000,003E,0180,0968,0000,0001    ;2026              LC_RC[0D],RETURN1
U 103E, 0000,003E,0180,0970,0000,0001    ;2027              LC_RC[0E],RETURN1
U 103F, 0000,003E,0180,0978,0000,0001    ;2028              LC_RC[0F],RETURN1
                                         ;2029    ; THIS ROUTINE IS USED TO FILL ALL RC WITH THE
                                         ;2030    ; CONTENTS OF Q.
                                         ;2031    =0
U 1042, 0F00,003D,0180,0800,0000,1288    ;2032    RC.Q:     D_0,CALL,J/DC.NF
U 1043, 0000,003C,0180,0800,0000,1044    ;2033              NOP
                                         ;2034    =0
U 1044, 0000,193D,0180,0800,0000,1020    ;2035    RC.QA:    CALL,D3-0?,J/WRRC
U 1045, 0819,0014,0580,0800,0010,1299    ;2036              D_D+K[.1],CLK.UBCC
U 1299, 0000,013C,0180,0800,0000,1048    ;2037              Z?
U 1048, 0000,003C,0180,0800,0000,1044    ;2038    =0        J/RC.QA
U 1049, 0000,003E,0180,0800,0000,0001    ;2039              RETURN1
```

```
                                    ;2040           .PAGE   "TEST 4E        FLOAT 1 THROUGH 0'S IN RC REGISTERS TEST"
                                    ;2041   ;*************************************************************
                                    ;2042   ;++
                                    ;2043   ; TEST  4E      FLOATING 1 THROUGH 0'S TEST OF RC REGISTERS
                                    ;2044   ;
                                    ;2045   ; TEST DESCRIPTION
                                    ;2046   ;       THIS TEST FLOATS A 1 THRU 0'S IN EACH RC SCRATCH PAD
                                    ;2047   ;       REGISTER.
                                    ;2048   ;
                                    ;2049   ; LOGIC DESCRIPTION
                                    ;2050   ;       THIS IS A TEST OF THE REGISTER CONTROL FIELD, USPO, DECODE
                                    ;2051   ;       ON DAP, THE REGISTER ADDRESS MUX ON DAP IS TESTED.
                                    ;2052   ;       ALSO TESTED ARE THE REGISTER CHIPS THEMSELVES AND THEIR INPUT
                                    ;2053   ;       TO THE BMX. IF THE REGISTER CONTROL SIGNALS OR THE REGISTER
                                    ;2054   ;       ADDRESSES ARE INCORRECT THEN DAP IS AT FAULT. IF THE PROBLEM
                                    ;2055   ;       IS NOT WITH THE ADDRESS OR CONTROL LINES THEN ONE OF THE
                                    ;2056   ;       DATA PATH BIT SLICES IS AT FAULT. THE BIT SLICES
                                    ;2057   ;       ARE PARTITIONED THUS:
                                    ;2058   ;               BITS <07:00>    ARE ON DCP
                                    ;2059   ;               BITS <15:08>    ARE ON DDP
                                    ;2060   ;               BITS <31:16>    ARE ON DEP
                                    ;2061   ;       CAREFUL INSPECTION OF THE EXPECTED AND RECIEVED DATA SHOULD
                                    ;2062   ;       IDENTIFY WHICH BIT SLICE IS AT FAULT.
                                    ;2063   ;
                                    ;2064   ; ERROR DESCRIPTIO
                                    ;2065   ;       EXPECTED DATA
                                    ;2066   ;       GOT DATA
                                    ;2067   ;       REGISTER ADDRESS
                                    ;2068   ;
                                    ;2069   ;--
                                    ;2070   ;*************************************************************
                                    ;2071   =0
U 104A, 0000,003D,0180,0800,0000,1268   ;2072   FL1RC:  NEWTST
U 104B, 0000,003C,01F8,0800,0000,1050   ;2073           Q_0
U 1050, 0000,003D,0180,0800,0000,1042   ;2074   =0      CALL,J/RC.Q             ; CLEAR ALL RC REGISTERS.
U 1051, 0000,003C,0180,0800,0000,1052   ;2075           NOP
U 1052, 0000,003D,0180,0800,0000,1288   ;2076   =0      CALL,J/DC.NF            ; SET UP A COUNTER IN D.
U 1053, 0001,003C,0180,0A80,0000,1054   ;2077           R[0]_D
                                        ;2078   =0
U 1054, 0018,0039,0580,0A88,0000,1279   ;2079   FL1RC1: R[1]_K[.1],ERLOOP
U 1055, 0800,003C,0180,0A00,0000,1058   ;2080   FL1RC2: D_R[0]
U 1058, 0000,193D,01C0,0A08,0000,1020   ;2081   =0      CALL,D3-0?,J/WRRC,Q_R[1]        ; WRITE TEST PATTERN
U 1059, 0000,003C,0180,0800,0000,1060   ;2082           NOP
U 1060, 0000,193D,0180,0800,0000,1030   ;2083   =0      CALL,D3-0?,J/LTCHRC     : READ TEST PATTERN
U 1061, 0011,2000,0180,0800,0010,129A   ;2084           ALU_Q[A-B]LC,CLK.UBCC
U 129A, 0000,013C,0180,0800,0000,1062   ;2085           Z?                      ; Q=LC?
U 1062, 0018,0038,0D80,09F8,0000,129B   ;2086   =0      J/FL1RC3,RC[0F]_K[.3]
U 1063, 0000,003C,0180,0800,0000,129E   ;2087           J/FL1RC4
U 129B, 0001,203C,0180,09F0,0000,129C   ;2088   FL1RC3: RC[0E]_Q
U 129C, 0010,0038,0180,09E8,0000,129D   ;2089           RC[0D]_LC
U 129D, 0001,003D,0180,09E0,0000,127A   ;2090           ERROR1,RC[0C]_D         ; RC REGISTER DATA INCORRECT
U 129E, 0000,003C,01C0,0A08,0010,129F   ;2091   FL1RC4: Q_R[1],CLK.UBCC         ; TRIED ALL PATTERNS YET?
U 129F, 0000,013C,01A8,0800,0000,1068   ;2092           Z?,Q_Q.LEFT,SI/3        ; IF NOT SHIFT PATTERN AND CONTINUE
U 1068, 0001,203C,0180,0A88,0000,1055   ;2093   =0      R[1]_Q,J/FL1RC2         ; TESTING THIS REGISTER
U 1069, 0000,003C,0180,0A00,0000,12A0   ;2094           LAB_R[0]
```

```
U 12A0, 0018,0014,0580,0A80,0010,12A1    ;2095          R[0]_LA+K[.1],CLK.UBCC  ; ALL REGISTERS TESTED?
U 12A1, 0000,013C,0180,0800,0000,106A    ;2096          Z?
U 106A, 0018,0038,0580,0A88,0000,1055    ;2097   =0     R[1]_K[.1],J/FL1RC2     ; IF NOT GO TO NEXT REGISTER
U 106B, 0000,003C,0180,0800,0000,1076    ;2098          NOP
```

```
                                                  .PAGE   "TEST 4F        FLOAT 0 THROUGH 1'S IN RC REGISTERS TEST"
                                        ;*************************************************************
                                        ;++
                                        ; TEST  4F      FLOATING 0 THROUGH 1'S TEST OF RC REGISTERS
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST FLOATS A 0 THRU 1'S IN EACH RC SCRATCH PAD
                                        ;       REGISTER.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS IS A TEST OF THE REGISTER CONTROL FIELD, USPO, DECODE
                                        ;       ON DAP, THE REGISTER ADDRESS MUX ON DAP IS TESTED.
                                        ;       ALSO TESTED ARE THE REGISTER CHIPS THEMSELVES AND THEIR INPUT
                                        ;       TO THE BMX. IF THE REGISTER CONTROL SIGNALS OR THE REGISTER
                                        ;       ADDRESSES ARE INCORRECT THEN DAP IS AT FAULT. IF THE PROBLEM
                                        ;       IS NOT WITH THE ADDRESS OR CONTROL LINES THEN ONE OF THE
                                        ;       DATA PATH BIT SLICES IS AT FAULT. THE BIT SLICES
                                        ;       ARE PARTITIONED THUS:
                                        ;               BITS <07:00>    ARE ON DCP
                                        ;               BITS <15:08>    ARE ON DDP
                                        ;               BITS <31:16>    ARE ON DEP
                                        ;       CAREFUL INSPECTION OF THE EXPECTED AND RECIEVED DATA SHOULD
                                        ;       IDENTIFY WHICH BIT SLICE IS AT FAULT.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED DATA
                                        ;       GOT DATA
                                        ;       REGISTER ADDRESS
                                        ;
                                        ;--
                                        ;*************************************************************
                                        =0
U 1076, 0000,003D,0180,0800,0000,1268   FLORC:  NEWTST
U 1077, 001B,0000,05C0,0800,0000,107E          Q_ALU,ALU_0-K[.1]
U 107E, 0000,003D,0180,0800,0000,1042   =0      CALL,J/RC_Q               ; SET ALL RC=-1
U 107F, 0000,003C,0180,0800,0000,1080          NOP
U 1080, 0000,003D,0180,0800,0000,1288   =0      CALL,J/DC.NF              ; SET UP COUNTER.
U 1081, 0001,003C,0180,0A80,0000,12A2          R[0]_D
U 12A2, 001B,0000,05C0,0800,0000,12A3   FLORC1: ALU_0-K[.1],Q_ALU
U 12A3, 0000,003C,01B0,0800,0000,1082          Q_Q.RIGHT,SI/3
U 1082, 0001,203D,0180,0A88,0000,1279   =0      R[1]_Q,ERLOOP
U 1083, 0800,003C,0180,0A00,0000,1084   FLORC2: D_R[0]
U 1084, 0000,193D,01C0,0A08,0000,1020   =0      CALL,BEN/D3-0,J/WRRC,Q_R[1]     ; WRITE TEST PATTERN
U 1085, 0000,003C,0180,0800,0000,1086          NOP
U 1086, 0000,193D,0180,0800,0000,1030   =0      CALL,D3-0?,J/LTCHRC       ; READ TEST PATTERN
U 1087, 0011,2000,0180,0800,0010,12A4          ALU_Q[A-B]LC,CLK.UBCC
U 12A4, 0000,013C,0180,0800,0000,1088          Z?                        ; Q=LC?
U 1088, 0018,0038,0D80,09F8,0000,12A5   =0      J/FLORC3,RC[0F]_K[.3]
U 1089, 0000,003C,0180,0800,0000,12A8          J/FLORC4
U 12A5, 0001,203C,0180,09F0,0000,12A6   FLORC3: RC[0E]_Q
U 12A6, 0010,0038,0180,09E8,0000,12A7          RC[0D]_LC
U 12A7, 0001,003D,0180,09E0,0000,127A          ERROR1,RC[0C]_D           ; RC REGSIER DATA INCORRECT
U 12A8, 0000,003C,01C0,0A08,0000,12A9   FLORC4: Q_R[1]
U 12A9, 0018,0014,0580,0800,0010,12AB          ALU_LA+K[.1],CLK.UBCC     ; TRIED ALL PATTERNS YET?
U 12AB, 0000,013C,0380,0800,0000,108A          Z?,Q_Q.RIGHT,SI/7         ; IF NOT SHIFT PATTERN AND CONTINUE
```

```
U 108A, 0001,203C,0180,0A88,0000,1083   ;2154   =0      R[1]_Q,J/FLORC2           ; TESTING THIS REGISTER
U 108B, 0000,003C,0180,0A00,0000,12AC   ;2155           LAB_R[0]
U 12AC, 0018,0014,0580,0A80,0010,12AD   ;2156           R[0]_LA+K[.1],CLK.UBCC    ; ALL REGISTER TESTED?
U 12AD, 0000,013C,0180,0800,0000,108C   ;2157           Z?
U 108C, 0000,003C,0180,0800,0000,12A2   ;2158   =0      J/FLORC1                  ; IF NOT CONTINUE
U 108D, 0000,003C,0180,0800,0000,108E   ;2159           NOP
```

```
                                        ;2160          .PAGE   "TEST 50        RC REGISTERS FOREWARD DUAL ADDRESSING TEST"
                                        ;2161   ;**************************************************************
                                        ;2162   ;++
                                        ;2163   ; TEST  50      RC FOREWARD DUAL ADDRESSING TEST
                                        ;2164   ;
                                        ;2165   ; TEST DESCRIPTION
                                        ;2166   ;      THIS TEST WRITES THE PATTERN:
                                        ;2167   ;              00000000        IN RC[0]
                                        ;2168   ;              11111111        IN RC[1]
                                        ;2169   ;              22222222        IN RC[2]
                                        ;2170   ;              33333333        IN RC[3]
                                        ;2171   ;                 ETC. TO
                                        ;2172   ;              FFFFFFFF        IN RC[0F]
                                        ;2173   ;      AND THEN GOES BACK TO READ THE PATTERNS OUT. HERE
                                        ;2174   ;      THE REGISTERS ARE WRITTEN IN THE FOREWARD, INCREMENTING THE ADDRESS,
                                        ;2175   ;      DIRECTION.
                                        ;2176   ;
                                        ;2177   ; LOGIC DESCRIPTION
                                        ;2178   ;      THIS IS A TEST OF THE REGISTER CONTRCL FIELD, USPO, DECODE
                                        ;2179   ;      ON DAP, THE REGISTER ADDRESS MUX ON DAP IS TESTED.
                                        ;2180   ;      ALSO TESTED ARE THE REGISTER CHIPS THEMSELVES AND THEIR INPUT
                                        ;2181   ;      TO THE BMX. IF THE REGISTER CONTROL SIGNALS OR THE REGISTER
                                        ;2182   ;      ADDRESSES ARE INCORRECT THEN DAP IS AT FAULT. IF THE PROBLEM
                                        ;2183   ;      IS NOT WITH THE ADDRESS OR CONTROL LINES THEN ONE OF THE
                                        ;2184   ;      DATA PATH BIT SLICES IS AT FAULT. THE BIT SLICES
                                        ;2185   ;      ARE PARTITIONED THUS:
                                        ;2186   ;              BITS <07:00>    ARE ON DCP
                                        ;2187   ;              BITS <15:08>    ARE ON DDP
                                        ;2188   ;              BITS <31:16>    ARE ON DEP
                                        ;2189   ;      CAREFUL INSPECTION OF THE EXPECTED AND RECIEVED DATA SHOULD
                                        ;2190   ;      IDENTIFY WHICH BIT SLICE IS AT FAULT.
                                        ;2191   ;
                                        ;2192   ; ERROR DESCRIPTION
                                        ;2193   ;      EXPECTED DATA, ALSO REG ADDRESS IN BITS <03:00>
                                        ;2194   ;      GOT DATA
                                        ;2195   ;
                                        ;2196   ;--
                                        ;2197   ;**************************************************************
                                        ;2198   =0
U 108E, 0000,003D,0180,0800,0000,1268   ;2199   RCDA1:  NEWTST
U 108F, 0F00,003C,0180,0800,0000,1090   ;2200           D_0             ; INITIALIZE DATA AND REGISTER ADDRESS
                                        ;2201   =0
U 1090, 0000,193D,0180,0800,0000,1010   ;2202   RCD1A:  CALL,D3-0?,J/DC0
U 1091, 0000,003C,0180,0800,0000,1092   ;2203           NOP
U 1092, 0000,193D,0180,0800,0000,1010   ;2204   =0      CALL,D3-0?,J/DC0
U 1093, 0000,003C,0180,0800,0000,1094   ;2205           NOP
U 1094, 0000,193D,0180,0800,0000,1010   ;2206   =0      CALL,D3-0?,J/DC0
U 1095, 0000,003C,0180,0800,0000,1096   ;2207           NOP
U 1096, 0000,193D,0180,0800,0000,1010   ;2208   =0      CALL,D3-0?,J/DC0
U 1097, 0000,003C,0180,0800,0000,1098   ;2209           NOP
U 1098, 0000,193D,0180,0800,0000,1010   ;2210   =0      CALL,D3-0?,J/DC0
U 1099, 0000,003C,0180,0800,0000,109A   ;2211           NOP
U 109A, 0000,193D,0180,0800,0000,1010   ;2212   =0      CALL,D3-0?,J/DC0
U 109B, 0000,003C,0180,0800,0000,109C   ;2213           NOP
U 109C, 0000,193D,0180,0800,0000,1010   ;2214   =0      CALL,D3-0?,J/DC0
```

```
U 109D, 0000,003C,0180,0800,0000,109E   ;2215                   NOP
U 109E, 0000,193D,0180,0800,0000,1010   ;2216   =0              CALL,D3-0?,J/DCO
U 109F, 0000,003C,01E0,0800,0000,10A0   ;2217                   Q_D
U 10A0, 0000,193D,0180,0800,0000,1020   ;2218   =0              CALL,D3-0?,J/WRRC ; GO WRITE THIS DATA INTO
                                        ;2219                                     ; THE REGISTER ADDRESSED BY D<03:00>
U 10A1, 0819,0014,0580,0800,0010,12AE   ;2220                   ALU_D+K[.1],D_ALU,CLK.UBCC ; WRITTEN ALL REGISTER?
U 12AE, 0000,013C,0180,0800,0000,10A2   ;2221                   Z?
U 10A2, 0000,003C,0180,0800,0000,1090   ;2222   =0              J/RCD1A          ; IF NOT CONTINUE.
U 10A3, 0F00,003C,01F8,0800,0000,10A4   ;2223                   D_0,Q_0          ; NOW GO READ ALL REGISTER BACK.
U 10A4, 0000,003D,0180,0800,0000,1279   ;2224   =0              ERLOOP
U 10A5, 0C00,003C,0180,0800,0000,10A6   ;2225                   D_Q
                                        ;2226   =0
U 10A6, 0000,193D,0180,0800,0000,1010   ;2227   RCD1B:          CALL,D3-0?,J/DCO
U 10A7, 0000,003C,0180,0800,0000,10A8   ;2228                   NOP
U 10A8, 0000,193D,0180,0800,0000,1010   ;2229   =0              CALL,D3-0?,J/DCO
U 10A9, 0000,003C,0180,0800,0000,10AA   ;2230                   NOP
U 10AA, 0000,193D,0180,0800,0000,1010   ;2231   =0              CALL,D3-0?,J/DCO
U 10AB, 0000,003C,0180,0800,0000,10AC   ;2232                   NOP
U 10AC, 0000,193D,0180,0800,0000,1010   ;2233   =0              CALL,D3-0?,J/DCO
U 10AD, 0000,003C,0180,0800,0000,10AE   ;2234                   NOP
U 10AE, 0000,193D,0180,0800,0000,1010   ;2235   =0              CALL,D3-0?,J/DCO
U 10AF, 0000,003C,0180,0800,0000,10B0   ;2236                   NOP
U 10B0, 0000,193D,0180,0800,0000,1010   ;2237   =0              CALL,D3-0?,J/DCO
U 10B1, 0000,003C,0180,0800,0000,10B2   ;2238                   NOP
U 10B2, 0000,193D,0180,0800,0000,1010   ;2239   =0              CALL,D3-0?,J/DCO
U 10B3, 0000,003C,0180,0800,0000,10B4   ;2240                   NOP
U 10B4, 0000,193D,0180,0800,0000,1010   ;2241   =0              CALL,D3-0?,J/DCO
U 10B5, 0000,003C,01E0,0800,0000,10B6   ;2242                   Q_D
U 10B6, 0000,193D,0180,0800,0000,1030   ;2243   =0              CALL,D3-0?,J/LTCHRC ; READ THE REGISTER.
U 10B7, 0011,2000,0180,0800,0010,12AF   ;2244   RCD1D:          ALU_Q[A-B]LC,CLK.UBCC ; CHECK LC
U 12AF, 0000,013C,0180,0800,0000,10B8   ;2245                   Z?
U 10B8, 0000,003C,0180,0800,0000,12B0   ;2246   =0              J/RCD1E
U 10B9, 0000,003C,0180,0800,0000,12B3   ;2247                   J/RCD1F
U 12B0, 0018,0038,0980,09F8,0000,12B1   ;2248   RCD1E:          RC[0F]_K[.2]
U 12B1, 0001,203C,0180,09F0,0000,12B2   ;2249                   RC[0E]_Q
U 12B2, 0010,0039,0180,09E8,0000,127A   ;2250                   RC[0D]_LC,ERROR1 ; RC ADDRESSING FAILURE.
U 12B3, 0819,0014,0580,0800,0010,12B4   ;2251   RCD1F:          ALU_D+K[.1],D_ALU,CLK.UBCC ; CHECKED ALL REGISTERS?
U 12B4, 0000,013C,0180,0800,0000,10BA   ;2252                   Z?
U 10BA, 0000,003C,0180,0800,0000,10A6   ;2253   =0              J/RCD1B          ; IF NOT CONTINUE.
U 10BB, 0000,003C,0180,0800,0000,10BC   ;2254                   NOP
```

```
                                              .PAGE   "TEST 51        RC REGISTERS BACKWARD DUAL ADDRESSING TEST"
                                      ;*************************************************************
                                      ;++
                                      ; TEST  51      RC BACKWARD DUAL ADDRESSING TEST
                                      ;
                                      ; TEST DESCRIPTION
                                      ;       THIS TEST WRITES THE PATTERN:
                                      ;               FFFFFFFF        IN RC[OF]
                                      ;               EEEEEEEE        IN RC[OE]
                                      ;               DDDDDDDD        IN RC[OD]
                                      ;               CCCCCCCC        IN RC[OC]
                                      ;                  ETC. TO
                                      ;               00000000        IN RC[0]
                                      ;       AND THEN GOES BACK TO READ THE PATTERNS OUT. HERE
                                      ;       THE REGISTERS ARE WRITTEN IN THE BACKWARD, DECREMENTING THE ADDRESS,
                                      ;       DIRECTION.
                                      ;
                                      ; LOGIC DESCRIPTION
                                      ;       THIS IS A TEST OF THE REGISTER CONTRCL FIELD, USPO, DECODE
                                      ;       ON DAP, THE REGISTER ADDRESS MUX ON DAP IS TESTED.
                                      ;       ALSO TESTED ARE THE REGISTER CHIPS THEMSELVES AND THEIR INPUT
                                      ;       TO THE BMX. IF THE REGISTER CONTROL SIGNALS OR THE REGISTER
                                      ;       ADDRESSES ARE INCORRECT THEN DAP IS AT FAULT. IF THE PROBLEM
                                      ;       IS NOT WITH THE ADDRESS OR CONTROL LINES THEN ONE OF THE
                                      ;       DATA PATH BIT SLICES IS AT FAULT. THE BIT SLICES
                                      ;       ARE PARTITIONED THUS:
                                      ;               BITS <07:00>    ARE ON DCP
                                      ;               BITS <15:08>    ARE ON DDP
                                      ;               BITS <31:16>    ARE ON DEP
                                      ;       CAREFUL INSPECTION OF THE EXPECTED AND RECIEVED DATA SHOULD
                                      ;       IDENTIFY WHICH BIT SLICE IS AT FAULT.
                                      ;
                                      ; ERROR DESCRIPTION
                                      ;       EXPECTED DATA, ALSO REG ADDRESS IN BITS <03:00>
                                      ;       GOT DATA
                                      ;
                                      ;--
                                      ;*************************************************************
                                      =0
U 10BC, 0000,003D,0180,0800,0000,1268  RCDA2:  NEWTST
U 10BD, 0F00,003C,0180,0800,0000,10BE          D_0             ; INITIALIZE DATA AND REGISTER ADDRESS
U 10BE, 0000,003D,0180,0800,0000,101F  =0      CALL,J/DCF
U 10BF, 0000,003C,0180,0800,0000,10C0          NOP
                                      =0
U 10C0, 0000,193D,0180,0800,0000,1010  RCD2A:  CALL,D3-0?,J/DC0
U 10C1, 0000,003C,0180,0800,0000,10C2          NOP
U 10C2, 0000,193D,0180,0800,0000,1010  =0      CALL,D3-0?,J/DC0
U 10C3, 0000,003C,0180,0800,0000,10C4          NOP
U 10C4, 0000,193D,0180,0800,0000,1010  =0      CALL,D3-0?,J/DC0
U 10C5, 0000,003C,0180,0800,0000,10C6          NOP
U 10C6, 0000,193D,0180,0800,0000,1010  =0      CALL,D3-0?,J/DC0
U 10C7, 0000,003C,0180,0800,0000,10C8          NOP
U 10C8, 0000,193D,0180,0800,0000,1010  =0      CALL,D3-0?,J/DC0
U 10C9, 0000,003C,0180,0800,0000,10CA          NOP
U 10CA, 0000,193D,0180,0800,0000,1010  =0      CALL,D3-0?,J/DC0
```

```
 U 10CB, 0000,003C,0180,0800,0000,10CC   ;2310             NOP
 U 10CC, 0000,193D,0180,0800,0000,1010   ;2311    =0       CALL,D3-0?,J/DC0
 U 10CD, 0000,003C,0180,0800,0000,10CE   ;2312             NOP
 U 10CE, 0000,193D,0180,0800,0000,1010   ;2313    =0       CALL,D3-0?,J/DC0
 U 10CF, 0000,003C,01E0,0800,0000,10D0   ;2314             Q_D
 U 10D0, 0000,193D,0180,0800,0000,1020   ;2315    =0       CALL,D3-0?,J/WRRC ; GO WRITE THIS DATA INTO
                                         ;2316                                ; THE REGISTER ADDRESSED BY D<03:00>
 U 10D1, 0001,003C,0180,0800,0010,12B5   ;2317             ALU_D,CLK.UBCC ; WRITTEN ALL REGISTER?
 U 12B5, 0000,013C,0180,0800,0000,10D2   ;2318             Z?
 U 10D2, 0819,0000,0580,0800,0000,10C0   ;2319    =0       D_D-K[.1],J/RCD2A ; IF NOT CONTINUE.
 U 10D3, 0F00,003C,01F8,0800,0000,10D4   ;2320             D_0,Q_0          ; NOW GO READ ALL REGISTER BACK.
 U 10D4, 0000,003D,0180,0800,0000,101F   ;2321    =0       CALL,J/DCF
 U 10D5, 0000,003C,01E0,0800,0000,10D6   ;2322             Q_D
 U 10D6, 0000,003D,0180,0800,0000,1279   ;2323    =0       ERLOOP
 U 10D7, 0C00,003C,0180,0800,0000,10D8   ;2324             D_Q
                                         ;2325    =0
|U 10D8, 0000,193D,0180,0800,0000,1010   ;2326    RCD2B:   CALL,D3-0?,J/DC0
|U 10D9, 0000,003C,0180,0800,0000,10DA   ;2327             NOP
|U 10DA, 0000,193D,0180,0800,0000,1010   ;2328    =0       CALL,D3-0?,J/DC0
|U 10DB, 0000,003C,0180,0800,0000,10DC   ;2329             NOP
|U 10DC, 0000,193D,0180,0800,0000,1010   ;2330    =0       CALL,D3-0?,J/DC0
|U 10DD, 0000,003C,0180,0800,0000,10DE   ;2331             NOP
|U 10DE, 0000,193D,0180,0800,0000,1010   ;2332    =0       CALL,D3-0?,J/DC0
|U 10DF, 0000,003C,0180,0800,0000,10E0   ;2333             NOP
|U 10E0, 0000,193D,0180,0800,0000,1010   ;2334    =0       CALL,D3-0?,J/DC0
|U 10E1, 0000,003C,0180,0800,0000,10E2   ;2335             NOP
|U 10E2, 0000,193D,0180,0800,0000,1010   ;2336    =0       CALL,D3-0?,J/DC0
|U 10E3, 0000,003C,0180,0800,0000,10E4   ;2337             NOP
|U 10E4, 0000,193D,0180,0800,0000,1010   ;2338    =0       CALL,D3-0?,J/DC0
|U 10E5, 0000,003C,0180,0800,0000,10E6   ;2339             NOP
|U 10E6, 0000,193D,0180,0800,0000,1010   ;2340    =0       CALL,D3-0?,J/DC0
|U 10E7, 0000,003C,01E0,0800,0000,10E8   ;2341             Q_D
|U 10E8, 0000,193D,0180,0800,0000,1030   ;2342    =0       CALL,D3-0?,J/LTCHRC ; READ THE REGISTER.
|U 10E9, 0011,2000,0180,0800,0010,12B6   ;2343    RCD2D:   ALU_Q[A-B]LC,CLK.UBCC ; CHECK LC
|U 12B6, 0000,013C,0180,0800,0000,10EA   ;2344             Z?
|U 10EA, 0000,003C,0180,0800,0000,12B7   ;2345    =0       J/RCD2E
|U 10EB, 0000,003C,0180,0800,0000,12BA   ;2346             J/RCD2F
|U 12B7, 0018,0038,0980,09F8,0000,12B8   ;2347    RCD2E:   RC[0F]_K[.2]
|U 12B8, 0001,203C,0180,09F0,0000,12B9   ;2348             RC[0E]_Q
|U 12B9, 0010,0039,0180,09E8,0000,127A   ;2349             RC[0D]_LC,ERROR1 ; RC ADDRESSING FAILURE.
|U 12BA, 0001,003C,0180,0800,0010,12BB   ;2350    RCD2F:   ALU_D,CLK.UBCC ; CHECKED ALL REGISTERS?
|U 12BB, 0000,013C,0180,0800,0000,10EC   ;2351             Z?
|U 10EC, 0819,0000,0580,0800,0000,10D8   ;2352    =0       D_D-K[.1],J/RCD2B ; IF NOT CONTINUE.
|U 10ED, 0000,003C,0180,0800,0000,10EE   ;2353             NOP
```

```
                                                  .PAGE   "TEST 52       GALLOP 1'S IN RC REGISTERS TEST"
                                          ;*************************************************************
                                          ;++
                                          ; TEST  52      GALLOPING 1'S TEST OF RC REGISTERS
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS TEST PERFORMS A GALLOPPING 1'S TEST OF THE RC
                                          ;       SCRATCH PAD REGISTERS.
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;       THIS IS A TEST OF THE REGISTER CONTROL FIELD, USPO, DECODE
                                          ;       ON DAP, THE REGISTER ADDRESS MUX ON DAP IS TESTED.
                                          ;       ALSO TESTED ARE THE REGISTER CHIPS THEMSELVES AND THEIR INPUT
                                          ;       TO THE BMX. IF THE REGISTER CONTROL SIGNALS OR THE REGISTER
                                          ;       ADDRESSES ARE INCORRECT THEN DAP IS AT FAULT. IF THE PROBLEM
                                          ;       IS NOT WITH THE ADDRESS OR CONTROL LINES THEN ONE OF THE
                                          ;       DATA PATH BIT SLICES IS AT FAULT. THE BIT SLICES
                                          ;       ARE PARTITIONED THUS:
                                          ;               BITS <07:00>    ARE ON DCP
                                          ;               BITS <15:08>    ARE ON DDP
                                          ;               BITS <31:16>    ARE ON DEP
                                          ;       CAREFUL INSPECTION OF THE EXPECTED AND RECIEVED DATA SHOULD
                                          ;       IDENTIFY WHICH BIT SLICE IS AT FAULT.
                                          ;       IF THE PREVIOUS TESTS RUN WITHOUT ERRORS THEN IF THIS TEST
                                          ;       FAILS THE MEMORY CHIPS THEMSELVES ARE MOST PROBABLY AT FAULT.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       DATA READ
                                          ;       ADDRESS FOR 1'S
                                          ;       ADDRESS OF 0'S
                                          ;       EXPECTED DATA
                                          ;
                                          ;--
                                          ;*************************************************************
                                          =0
U 10EE, 0000,003D,0180,0800,0000,1268     LCT1:   NEWTST
U 10EF, 0000,003C,01F8,0800,0000,10F0             Q_0
U 10F0, 0000,003D,0180,0800,0000,1042     =0      CALL,J/RC.Q               ; FILL RC WITH 0'S
U 10F1, 0F00,003C,0180,0800,0000,10F2             D_0
U 10F2, 0000,003D,0180,0800,0000,1288     =0      CALL, /DC.NF              ; PUT -0F INTO D.
U 10F3, 0000,003C,0180,0800,0000,10F4             NOP
                                          =0
U 10F4, 0000,193D,0180,0800,0000,1030     LCT1A:  CALL,D3-0?,J/LTCHRC       ; LATCH RC [D<3:0>]
U 10F5, 0010,0038,0180,0800,0010,12BC             ALU_LC,CLK.UBCC
U 12BC, 0000,013C,0180,0800,0000,10F6             Z?                        ; LC=0?
U 10F6, 0018,0038,1180,09F8,0000,12BD     =0      J/LCT1A1,RC[0F]_K[.4]
U 10F7, 0000,003C,0180,0800,0000,12C0             J/LCT1A2
U 12BD, 0010,0038,0180,09F0,0000,12BE     LCT1A1: RC[0E]_LC
U 12BE, 0003,003C,0180,09D8,0000,12BF             RC[0B]_0
U 12BF, 0001,003D,0180,09E8,0000,127A             ERROR1,RC[0D]_D
U 12C0, 0000,003C,01F8,0800,0000,12C1     LCT1A2: Q_0
U 12C1, 0019,2000,05C0,0AA8,0000,10F8             Q_Q-K[.1],R[5]_Q-K[.1]
U 10F8, 0000,193D,0180,0A28,0000,1020     =0      CALL,D3-0?,J/WRRC,LAB_R[5]      ; MAKE RC =-1
U 10F9, 0000,003C,01E0,0800,0000,10FA             Q_D
U 10FA, 0000,003D,0180,0800,0000,1288     =0      CALL,J/DC.NF
```

```
U 10FB, 001D,2000,0180,0800,0010,12C2   ;2409   LCT1C:  ALU_Q-D,CLK.UBCC
U 12C2, 0000,013C,0180,0800,0000,10FC   ;2410           Z?
U 10FC, 0C00,003C,01E0,0800,0000,10FE   ;2411   =0      D_Q,Q_D,J/LCT1E
U 10FD, 0000,003C,0180,0800,0000,12D5   ;2412           J/LCT1I
                                        ;2413   =0
U 10FE, 0000,193D,0180,0800,0000,1030   ;2414   LCT1E:  CALL,D3-0?,J/LTCHRC     ; READ -1
U 10FF, 0010,0000,0180,0800,0010,12C3   ;2415           ALU_LA[A-B]LC,CLK.UBCC
U 12C3, 0000,013C,0180,0800,0000,110A   ;2416           Z?                      ; LC=-1?
U 110A, 0018,0038,1180,09F8,0000,12C4   ;2417   =0      J/LCT1E1,RC[0F]_K[.4]
U 110B, 0000,003C,0180,0800,0000,12C8   ;2418           J/LCT1E2
U 12C4, 0010,0038,0180,09F0,0000,12C5   ;2419   LCT1E1: RC[0E]_LC
U 12C5, 0001,003C,0180,09E8,0000,12C6   ;2420           RC[0D]_D
U 12C6, 001B,0000,0580,09D8,0000,12C7   ;2421           ALU_0-K[.1],RC[0B]_ALU
U 12C7, 0001,203D,0180,09E0,0000,127A   ;2422           ERROR1,RC[0C]_Q
U 12C8, 0C00,003C,01E0,0800,0000,1110   ;2423   LCT1E2: D_Q,Q_D
U 1110, 0000,193D,0180,0800,0000,1030   ;2424   =0      CALL,D3-0?,J/LTCHRC     ;READ 0
U 1111, 0010,0038,0180,0800,0010,12C9   ;2425           ALU_LC,CLK.UBCC
U 12C9, 0000,013C,0180,0800,0000,1112   ;2426           Z?                      ; LC=0?
U 1112, 0018,0038,1180,09F8,0000,12CA   ;2427   =0      J/LCT1E3,RC[0F]_K[.4]
U 1113, 0000,003C,0180,0800,0000,12CE   ;2428           J/LCT1E4
U 12CA, 0010,0038,0180,09F0,0000,12CB   ;2429   LCT1E3: RC[0E]_LC
U 12CB, 0001,003C,0180,09E8,0000,12CC   ;2430           RC[0D]_D
U 12CC, 0003,003C,0180,09D8,0000,12CD   ;2431           RC[0B]_0
U 12CD, 0001,203D,0180,09E0,0000,127A   ;2432           ERROR1,RC[0C]_Q
U 12CE, 0C00,003C,01E0,0800,0000,1114   ;2433   LCT1E4: D_Q,Q_D
U 1114, 0000,193D,0180,0800,0000,1030   ;2434   =0      CALL,D3-0?,J/LTCHRC     ; READ -1
U 1115, 0010,0000,0180,0800,0010,12CF   ;2435           ALU_LA[A-B]LC,CLK.UBCC
U 12CF, 0000,013C,0180,0800,0000,1116   ;2436           Z?                      ; LC=-1?
U 1116, 0018,0038,1180,09F8,0000,12D0   ;2437   =0      J/LCT1E5,RC[0F]_K[.4]
U 1117, 0000,003C,0180,0800,0000,12D4   ;2438           J/LCT1E6
U 12D0, 0010,0038,0180,09F0,0000,12D1   ;2439   LCT1E5: RC[0E]_LC
U 12D1, 0001,003C,0180,09E8,0000,12D2   ;2440           RC[0D]_D
U 12D2, 001B,0000,0580,09D8,0000,12D3   ;2441           ALU_0-K[.1],RC[0B]_ALU
U 12D3, 0001,203D,0180,09E0,0000,127A   ;2442           ERROR1,RC[0C]_Q
U 12D4, 0C00,003C,01E0,0800,0000,12D5   ;2443   LCT1E6: D_Q,Q_D
U 12D5, 0819,0014,0580,0800,0010,12D6   ;2444   LCT1I:  D_D+K[.1],CLK.UBCC
U 12D6, 0000,013C,0180,0800,0000,1118   ;2445           Z?
U 1118, 0000,003C,0180,0800,0000,10FB   ;2446   =0      J/LCT1C
U 1119, 0C00,003C,01E0,0800,0000,12D7   ;2447           D_Q,Q_D
U 12D7, 0000,003C,01F8,0800,0000,111A   ;2448           Q_0
U 111A, 0000,193D,0180,0800,0000,1020   ;2449   =0      CALL,D3-0?,J/WRRC
U 111B, 0819,0014,0580,0800,0010,12D8   ;2450           D_D+K[.1],CLK.UBCC
U 12D8, 0000,013C,0180,0800,0000,111C   ;2451           Z?
U 111C, 0000,003C,0180,0800,0000,10F4   ;2452   =0      J/LCT1A
U 111D, 0000,003C,0180,0800,0000,111E   ;2453           NOP
```

```
                                          ;2454          .PAGE   "TEST 53        GALLOP O'S IN RC REGISTERS TEST"
                                          ;2455   ;*************************************************************
                                          ;2456   ;++
                                          ;2457   ; TEST  53      GALLOPING O'S TEST OF RC REGISTERS
                                          ;2458   ;
                                          ;2459   ; TEST DESCRIPTION
                                          ;2460   ;      THIS TEST PERFORMS A GALLOPPING O'S TEST OF THE RC SCRATCH
                                          ;2461   ;      PAD REGISTERS.
                                          ;2462   ;
                                          ;2463   ; LOGIC DESCRIPTION
                                          ;2464   ;      THIS IS A TEST OF THE REGISTER CONTROL FIELD, USPO, DECODE
                                          ;2465   ;      ON DAP, THE REGISTER ADDRESS MUX ON DAP IS TESTED.
                                          ;2466   ;      ALSO TESTED ARE THE REGISTER CHIPS THEMSELVES AND THEIR INPUT
                                          ;2467   ;      TO THE BMX. IF THE REGISTER CONTROL SIGNALS OR THE REGISTER
                                          ;2468   ;      ADDRESSES ARE INCORRECT THEN DAP IS AT FAULT. IF THE PROBLEM
                                          ;2469   ;      IS NOT WITH THE ADDRESS OR CONTROL LINES THEN ONE OF THE
                                          ;2470   ;      DATA PATH BIT SLICES IS AT FAULT. THE BIT SLICES
                                          ;2471   ;      ARE PARTITIONED THUS:
                                          ;2472   ;              BITS <07:00>    ARE ON DCP
                                          ;2473   ;              BITS <15:08>    ARE ON DDP
                                          ;2474   ;              BITS <31:16>    ARE ON DEP
                                          ;2475   ;      CAREFUL INSPECTION OF THE EXPECTED AND RECIEVED DATA SHOULD
                                          ;2476   ;      IDENTIFY WHICH BIT SLICE IS AT FAULT.
                                          ;2477   ;      IF THIS TEST FAILS AND ALL THE PREVIOUS TESTS RUN THEN THE
                                          ;2478   ;      MEMORY CHIPS THEMSELVES ARE MOST PROBABLY AT FAULT.
                                          ;2479   ;
                                          ;2480   ; ERROR DESCRIPTION
                                          ;2481   ;      DATA READ
                                          ;2482   ;      ADDRESS FOR 0'S
                                          ;2483   ;      ADDRESS OF 1'S
                                          ;2484   ;      EXPECTED DATA
                                          ;2485   ;
                                          ;2486   ;--
                                          ;2487   ;*************************************************************
                                          ;2488   =0
U 111E, 0000,003D,0180,0800,0000,1268     ;2489   LCT2:   NEWTST
U 111F, 0000,003C,01F8,0800,0000,12D9     ;2490           Q_0
U 12D9, 0019,2000,05C0,0AA8,0000,1120     ;2491           Q_Q-K[.1],R[5]_Q-K[.1]
U 1120, 0000,003D,0180,0A28,0000,1042     ;2492   =0      CALL,J/RC.Q,LAB_R[5]
U 1121, 0F00,003C,0180,0800,0000,1122     ;2493           D_0
U 1122, 0000,003D,0180,0800,0000,1288     ;2494   =0      CALL,J/DC.NF
U 1123, 0000,003C,0180,0800,0000,1124     ;2495           NOP
                                          ;2496   =0
U 1124, 0000,193D,0180,0800,0000,1030     ;2497   LCT2A:  CALL,D3-0?,J/LTCHRC
U 1125, 0010,0000,0180,0800,0010,12DA     ;2498           ALU_LA[A-B]LC,CLK.UBCC  ; IS RC =-1?
U 12DA, 0000,013C,0180,0800,0000,1126     ;2499           Z?
U 1126, 0018,0038,1180,09F8,0000,12DB     ;2500   =0      J/LCT2A1,RC[0F]_K[.4]
U 1127, 0000,003C,0180,0800,0000,12DE     ;2501           J/LCT2A2
U 12DB, 0010,0038,0180,09F0,0000,12DC     ;2502   LCT2A1: RC[0E]_LC
U 12DC, 001B,0000,0580,09D8,0000,12DD     ;2503           ALU_0-K[.1],RC[0B]_ALU
U 12DD, 0001,003D,0180,09E8,0000,127A     ;2504           RC[0D]_D,ERROR1
U 12DE, 0000,003C,01F8,0800,0000,1128     ;2505   LCT2A2: Q_0
U 1128, 0000,193D,0180,0800,0000,1020     ;2506   =0      CALL,D3-0?,J/WRRC       ; WRITE 0.
U 1129, 0000,003C,01E0,0800,0000,112A     ;2507           Q_D
U 112A, 0000,003D,0180,0800,0000,1288     ;2508   =0      CALL,J/DC.NF
```

```
U 112B, 001D,2000,0180,0800,0010,12DF   ;2509   LCT2C:  ALU_Q-D,CLK.UBCC
U 12DF, 0000,013C,0180,0800,0000,112C   ;2510           Z?
U 112C, 0C00,003C,01E0,0800,0000,112E   ;2511   =0      D_Q,Q_D,J/LCT2E
U 112D, 0000,003C,0180,0800,0000,12F2   ;2512           J7LCT2I
                                        ;2513   =0
U 112E, 0000,193D,0180,0800,0000,1030   ;2514   LCT2E:  CALL,D3-0?,J/LTCHRC     ; READ 0
U 112F, 0010,0038,0180,0800,0010,12E0   ;2515           ALU_LC,CLK.UBCC
U 12E0, 0000,013C,0180,0800,0000,1130   ;2516           Z?                      ; IS LC=0?
U 1130, 0018,0038,1180,09F8,0000,12E1   ;2517   =0      J/LCT2E1,RC[0F]_K[.4]
U 1131, 0000,003C,0180,0800,0000,12E5   ;2518           J/LCT2E2
U 12E1, 0010,0038,0180,09F0,0000,12E2   ;2519   LCT2E1: RC[0E]_LC
U 12E2, 0001,003C,0180,09E8,0000,12E3   ;2520           RC[0D]_D
U 12E3, 0003,003C,0180,09D8,0000,12E4   ;2521           RC[0B]_0
U 12E4, 0001,203D,0180,09E0,0000,127A   ;2522           ERROR1,RC[0C]_Q
U 12E5, 0C00,003C,01E0,0800,0000,1132   ;2523   LCT2E2: D_Q,Q_D
U 1132, 0000,193D,0180,0800,0000,1030   ;2524   =0      CALL,D3-0?,J/LTCHRC     ; READ -1
U 1133, 0010,0000,0180,0800,0010,12E6   ;2525           ALU_LA[A-B]LC,CLK.UBCC
U 12E6, 0000,013C,0180,0800,0000,1134   ;2526           Z?                      ; IS LC=-1?
U 1134, 0018,0038,1180,09F8,0000,12E7   ;2527   =0      J/LCT2E3,RC[0F]_K[.4]
U 1135, 0000,003C,0180,0800,0000,12EB   ;2528           J/LCT2E4
U 12E7, 0010,0038,0180,09F0,0000,12E8   ;2529   LCT2E3: RC[0E]_LC
U 12E8, 0001,003C,0180,09E8,0000,12E9   ;2530           RC[0D]_D
U 12E9, 001B,0000,0580,09D8,0000,12EA   ;2531           ALU_0-K[.1],RC[0B]_ALU
U 12EA, 0001,203D,0180,09E0,0000,127A   ;2532           ERROR1,RC[0C]_Q
U 12EB, 0C00,003C,01E0,0800,0000,1136   ;2533   LCT2E4: D_Q,Q_D
U 1136, 0000,193D,0180,0800,0000,1030   ;2534   =0      CALL,D3-0?,J/LTCHRC     ; READ 0
U 1137, 0010,0038,0180,0800,0010,12EC   ;2535           ALU_LC,CLK.UBCC
U 12EC, 0000,013C,0180,0800,0000,1138   ;2536           Z?                      ; IS LC=0?
U 1138, 0018,0038,1180,09F8,0000,12ED   ;2537   =0      J/LCT2E5,RC[0F]_K[.4]
U 1139, 0000,003C,0180,0800,0000,12F1   ;2538           J/LCT2E6
U 12ED, 0010,0038,0180,09F0,0000,12EE   ;2539   LCT2E5: RC[0E]_LC
U 12EE, 0001,003C,0180,09E8,0000,12EF   ;2540           RC[0D]_D
U 12EF, 0003,003C,0180,09D8,0000,12F0   ;2541           RC[0B]_0
U 12F0, 0001,203D,0180,09E0,0000,127A   ;2542           ERROR1,RC[0C]_Q
U 12F1, 0C00,003C,01E0,0800,0000,12F2   ;2543   LCT2E6: D_Q,Q_D
U 12F2, 0819,0014,0580,0800,0010,12F3   ;2544   LCT2I:  D_D+K[.1],CLK.UBCC
U 12F3, 0000,013C,0180,0800,0000,113A   ;2545           Z?
U 113A, 0000,003C,0180,0800,0000,112B   ;2546   =0      J/LCT2C
U 113B, 0C00,003C,01E0,0800,0000,12F4   ;2547           D_Q,Q_D
U 12F4, 0000,003C,01F8,0800,0000,12F5   ;2548           Q_0
U 12F5, 0019,2000,05C0,0800,0000,113C   ;2549           Q_Q-K[.1]
U 113C, 0000,193D,0180,0800,0000,1020   ;2550   =0      CALL,D3-0?,J/WRRC
U 113D, 0819,0014,0580,0800,0010,12F6   ;2551           D_D+K[.1],CLK.UBCC
U 12F6, 0000,013C,0180,0800,0000,113E   ;2552           Z?
U 113E, 0000,003C,0180,0800,0000,1124   ;2553   =0      J/LCT2A
U 113F, 0000,003C,0180,0800,0000,1140   ;2554           NOP
```

```
                                                    .PAGE   "TEST 54        NIBBLE SWAP D, FLOAT 1 ACROSS 0'S, TEST"
                                             ;***********************************************************************
                                             ;++
                                             ; TEST  54       NIBBLE SWAP D, FLOAT 1 ACROSS 0'S, TEST
                                             ;
                                             ; TEST DESCRIPTION
                                             ;       THIS TEST FLOATS A 1 ACROSS A FIELD OF 0'S THROUGH
                                             ;       EACH BYTE OF THE D REGISTER WHILE PERFORMING A D
                                             ;       REGISTER NIBBLE SWAP IN THE DMX.
                                             ;
                                             ; LOGIC DESCRIPTION
                                             ;       TESTED HERE ARE THE UDK FUNCTION DECODE LOGIC, THE
                                             ;       DMX NIBBLE SWAP INPUTS AND THE LOAD D SIGNAL.
                                             ;       NOTE THAT ALL THIS LOGIC IS ON THE DBP BOARD.
                                             ;
                                             ; ERROR DESCRIPTION
                                             ;       EXPECTED D REGISTER
                                             ;       GOT D REGISTER
                                             ;       D REGISTER OPERAND BEFORE SWAP FUNCTION
                                             ;
                                             ;--
                                             ;***********************************************************************
                                             =0
U 1140, 0000,003D,0180,0800,0000,1268        DPT36:  NEWTST
U 1141, 0000,003C,0180,0800,0000,1142                NOP
                                             ; THE FOLLOWING REGISTER ARE USED DURING THIS TEST:
                                             ;       R[1] IS THE EXPECTED RESULT
                                             ;       R[OD] IS THE D OPERAND
                                             ;       R[8] IS A COUNTER
                                             ; NOTE THAT A SUBROUTINE IS USED TO EXECUTE
                                             ; THE BYTE SWAP AND CHECK THE RESULT.
                                             ;///////////////////////////////////////////////////////////////////////
                                             ;+
                                             ; SUBTEST        1
                                             ; FIRST TEST THE LOW BYTE.
                                             ;-
U 1142, 0000,003D,0180,0800,0000,127E        =0      SUBTEST
U 1143, 0018,8038,0D80,09F8,0000,12F7                RC[OF]_K[.3],DT/BYTE
U 12F7, 0F18,0038,C180,0800,0000,12F8                D_0,ALU_K[.FFFF]
U 12F8, 0500,003C,0380,0800,0000,1144                D_D.LEFT,SI/7
U 1144, 0000,003D,01E0,0800,0000,100A        =0      CALL,J/SHQLFT16,Q_D             ; R[1] IS USED TO COMPUTE
                                                                                     ; THE EXPECTED RESULT.
U 1145, 0001,003C,0180,0AE8,0000,1146                R[OD]_D
U 1146, 0000,003D,0180,0800,0000,100B        =0      CALL,J/SHQLFT8
U 1147, 0001,203C,0180,0A88,0000,1148                R[1]_Q
U 1148, 0000,003D,0180,0800,0000,115C        =0      CALL,J/DPT36S           ; GO TO THE SUBROUTINE TO
U 1149, 0000,003C,0180,0800,0000,114A                NOP                     ; EXECUTE THE TEST.
                                             ;///////////////////////////////////////////////////////////////////////
                                             ;+
                                             ; SUBTEST        2
                                             ; TEST BYTE TWO
                                             ;-
U 114A, 0000,003D,0180,0800,0000,127E        =0      SUBTEST
U 114B, 0000,003C,01C0,0A68,0000,114C                Q_R[OD]
U 114C, 0000,003D,0180,0800,0000,100B        =0      CALL,J/SHQLFT8
```

```
U 114D, 0001,203C,0180,0A88,0000,114E    ;2610           R[1]_Q
U 114E, 0000,003D,0180,0800,0000,115C    ;2611   =0      CALL,J/DPT36S
U 114F, 0000,003C,0180,0800,0000,1150    ;2612           NOP
                                         ;2613   ;//////////////////////////////////////////////////////////////
                                         ;2614   ;+
                                         ;2615   ; SUBTEST       3
                                         ;2616   ; TEST BYTE THREE
                                         ;2617   ;-
U 1150, 0000,003D,0180,0800,0000,127E    ;2618   =0      SUBTEST
U 1151, 0000,003C,01F8,0800,0000,12F9    ;2619           Q_0
U 12F9, 0000,003C,03A8,0800,0000,1152    ;2620           Q_Q.LEFT,SI/7
U 1152, 0000,003D,0180,0800,0000,100B    ;2621   =0      CALL,J/SHQLFT8
U 1153, 0001,203C,0180,0A88,0000,1156    ;2622           R[1]_Q
U 1156, 0000,003D,0180,0800,0000,115C    ;2623   =0      CALL,J/DPT36S
U 1157, 0000,003C,0180,0800,0000,1158    ;2624           NOP
                                         ;2625   ;//////////////////////////////////////////////////////////////
                                         ;2626   ;+
                                         ;2627   ; SUBTEST       4
                                         ;2628   ; TEST BYTE FOUR
                                         ;2629   ;-
U 1158, 0000,003D,0180,0800,0000,127E    ;2630   =0      SUBTEST
U 1159, 0000,003C,01F8,0800,0000,12FA    ;2631           Q_0
U 12FA, 0000,003C,03A8,0800,0000,12FB    ;2632           Q_Q.LEFT,SI/7
U 12FB, 0001,203C,0180,0A88,0000,115A    ;2633           R[1]_Q
U 115A, 0000,003D,0180,0800,0000,115C    ;2634   =0      CALL,J/DPT36S
U 115B, 0000,003C,0180,0800,0000,130A    ;2635           J/DPT36D                  ; TEST COMPLETED.
                                         ;2636                                     ; SUBROUTINE TO PERFORM TEST
                                         ;2637   =0
U 115C, 0F00,003D,0180,0800,0000,1018    ;2638   DPT36S: D_0,CALL,J/DC8            ; SET UP COUNTER.
U 115D, 0001,003C,0180,0AC0,0000,115E    ;2639           R[8]_D
U 115E, 0000,003D,0180,0800,0000,1279    ;2640   =0      ERLOOP                    ; SET LOOP ON ERROR ADDRESS.
U 115F, 0800,003C,0180,0A68,0000,12FC    ;2641   DPT36A: D_R[0D]                   ; SET UP OPERAND
U 12FC, 0001,003C,0180,09E0,0000,12FD    ;2642           R[0C]_D
U 12FD, 0000,003C,01C0,0A08,0000,12FE    ;2643           Q_R[1]                    ; GET EXPECTED RESULT
U 12FE, 0001,203C,0180,09F0,0000,12FF    ;2644           R[0E]_Q
U 12FF, 0B00,003C,0180,0800,0000,1300    ;2645           D_D.SWAP                  ; TEST INSTRUCTION
U 1300, 001D,2000,0180,0800,0010,1301    ;2646           A[U_Q-D,CLK.UBCC          ; RESULT CORRECT?
U 1301, 0000,013C,0180,0800,0000,1160    ;2647           Z?
U 1160, 0001,003D,0180,09E8,0000,127A    ;2648   =0      RC[0D]_D,ERROR1           ; BYTE SWAP FUNCTION FAILED
U 1161, 0800,003C,0180,0A68,0000,1302    ;2649           D_R[0D]                   ; COMPUTE NEXT TEST PATTERN
U 1302, 0000,003C,01C0,0A08,0000,1303    ;2650           Q_R[1]                    ; AND EXPECTED RESULT.
U 1303, 0000,003C,01A8,0800,0000,1304    ;2651           Q_Q.LEFT,SI/ZERO
U 1304, 0500,003C,0180,0800,0000,1305    ;2652           D_D.LEFT,SI/ZERO
U 1305, 0001,003C,0180,0AE8,0000,1306    ;2653           R[0D]_D
U 1306, 0001,203C,0180,0A88,0000,1307    ;2654           R[1]_Q
U 1307, 0000,003C,0180,0A40,0000,1308    ;2655           LAB_R[8]                  ; SEE IF LOOP HAS BEEN
U 1308, 0018,0000,0580,0AC0,0010,1309    ;2656           R[8]_LA-K[.1],CLK.UBCC    ; EXECUTED 8 TIMES
U 1309, 0000,013C,0180,0800,0000,1162    ;2657           Z?
U 1162, 0000,003C,0180,0800,0000,115F    ;2658   =0      J/DPT36A
U 1163, 0000,003E,0180,0800,0000,0001    ;2659           RETURN1                   ; RETURN IF YES
U 130A, 0000,003C,0180,0800,0000,1164    ;2660   DPT36D: NOP
```

```
                                            ;2661           .PAGE   "TEST 55        NIBBLE SWAP D, FLOAT 0 ACROSS 1'S, TEST"
                                            ;2662   ;***************************************************************
                                            ;2663   ;++
                                            ;2664   ; TEST  55      NIBBLE SWAP D, FLOAT 0 ACROSS 1'S, TEST
                                            ;2665   ;
                                            ;2666   ; TEST DESCRIPTION
                                            ;2667   ;       THIS TEST FLOATS A 0 ACROSS A FIELD OF 1'S THROUGH
                                            ;2668   ;       EACH BYTE OF THE D REGISTER WHILE PERFORMING A D
                                            ;2669   ;       REGISTER NIBBLE SWAP IN THE DMX.
                                            ;2670   ;
                                            ;2671   ; LOGIC DESCRIPTION
                                            ;2672   ;       TESTED HERE ARE THE UDK FUNCTION DECODE LOGIC, THE
                                            ;2673   ;       DMX NIBBLE SWAP INPUTS AND THE LOAD D SIGNAL.
                                            ;2674   ;       NOTE THAT ALL THIS LOGIC IS ON THE DBP BOARD.
                                            ;2675   ;
                                            ;2676   ; ERROR DESCRIPTION
                                            ;2677   ;       EXPECTED D REGISTER
                                            ;2678   ;       GOT D REGISTER
                                            ;2679   ;       D REGISTER OPERAND BEFORE SWAP FUNCTION
                                            ;2680   ;
                                            ;2681   ;--
                                            ;2682   ;***************************************************************
                                            ;2683   =0
U 1164, 0000,003D,0180,0800,0000,1268       ;2684   DPT37:  NEWTST
U 1165, 0000,003C,0180,0800,0000,1166       ;2685           NOP
                                            ;2686   ; THE FOLLOWING REGISTERS ARE USED DURING THIS TEST:
                                            ;2687   ;       R[1] IS THE EXPECTED RESULT
                                            ;2688   ;       R[0D] IS THE D OPERAND
                                            ;2689   ;       R[8] IS A COUNTER
                                            ;2690   ; NOTE THAT A SUBROUTINE IS USED
                                            ;2691   ; TO EXECUTE THE BYTE SWAP AND CHECK THE RESULT.
                                            ;2692   ;///////////////////////////////////////////////////////////////
                                            ;2693   ;+
                                            ;2694   ; SUBTEST       1
                                            ;2695   ; FIRST TEST THE LOW BYTE
                                            ;2696   ;-
U 1166, 0000,003D,0180,0800,0000,127E       ;2697   =0      SUBTEST
U 1167, 0018,8038,0D80,09F8,0000,1168       ;2698           RC[OF]_K[.3],DT/BYTE
U 1168, 0000,003D,0180,0800,0000,1040       ;2699   =0      CALL,J7SHQL16           ; PUT A -1 IN Q.
U 1169, 0000,003C,0180,0800,0000,116A       ;2700           NOP
U 116A, 0000,003D,0180,0800,0000,1040       ;2701   =0      CALL,J/SHQL16
U 116B, 0C00,003C,0180,0800,0000,130B       ;2702           D_Q                     ; Q=D=-1
U 130B, 0000,003C,01A8,0800,0000,130C       ;2703           Q_Q.LEFT,SI/ZERO        ; INITIALIZE THE OPERAND AND
U 130C, 0500,003C,0180,0800,0000,116C       ;2704           D_D.LEFT,SI/ZERO        ; EXPECTED RESULT
U 116C, 0000,003D,0180,0800,0000,1040       ;2705   =0      CALL,J/SHQL16
U 116D, 0001,003C,0180,0AE8,0000,116E       ;2706           R[0D]_D
U 116E, 0000,003D,0180,0800,0000,1291       ;2707   =0      CALL,J/SHQL8
U 116F, 0001,203C,0180,0A88,0000,1170       ;2708           R[1]_Q
U 1170, 0000,003D,0180,0800,0000,118A       ;2709   =0      CALL,J/DPT37S
U 1171, 0000,003C,0180,0800,0000,1172       ;2710           NOP
                                            ;2711   ;///////////////////////////////////////////////////////////////
                                            ;2712   ;+
                                            ;2713   ; SUBTEST       2
                                            ;2714   ; TEST BYTE TWO
                                            ;2715   ;-
```

```
U 1172, 0000,003D,0180,0800,0000,127E   ;2716   =0      SUBTEST
U 1173, 0000,003C,01C0,0A68,0000,1174   ;2717           Q_R[OD]
U 1174, 0000,003D,0180,0800,0000,1291   ;2718   =0      CALL,J/SHQL8
U 1175, 0001,203C,0180,0A88,0000,1176   ;2719           R[1]_Q
U 1176, 0000,003D,0180,0800,0000,118A   ;2720   =0      CALL,J/DPT37S
U 1177, 0000,003C,0180,0800,0000,1178   ;2721           NOP
                                        ;2722   ;///////////////////////////////////////////////////////////
                                        ;2723   ;+
                                        ;2724   ; SUBTEST       3
                                        ;2725   ; TEST BYTE THREE
                                        ;2726   ;-
U 1178, 0000,003D,0180,0800,0000,127E   ;2727   =0      SUBTEST
U 1179, 0000,003C,0180,0800,0000,117A   ;2728           NOP
U 117A, 0000,003D,0180,0800,0000,1040   ;2729   =0      CALL,J/SHQL16
U 117B, 0000,003C,0180,0800,0000,117C   ;2730           NOP
U 117C, 0000,003D,0180,0800,0000,1292   ;2731   =0      CALL,J/SHQL7
U 117D, 0000,003C,01A8,0800,0000,117E   ;2732           Q_Q.LEFT,SI/ZERO
U 117E, 0000,003D,0180,0800,0000,1291   ;2733   =0      CALL,J/SHQL8
U 117F, 0001,203C,0180,0A88,0000,1180   ;2734           R[1]_Q
U 1180, 0000,003D,0180,0800,0000,118A   ;2735   =0      CALL,J/DPT37S
U 1181, 0000,003C,0180,0800,0000,1182   ;2736           NOP
                                        ;2737   ;///////////////////////////////////////////////////////////
                                        ;2738   ;+
                                        ;2739   ; SUBTEST       4
                                        ;2740   ; TEST BYTE FOUR
                                        ;2741   ;-
U 1182, 0000,003D,0180,0800,0000,127E   ;2742   =0      SUBTEST
U 1183, 0000,003C,0180,0800,0000,1184   ;2743           NOP
U 1184, 0000,003D,0180,0800,0000,1040   ;2744   =0      CALL,J/SHQL16
U 1185, 0000,003C,0180,0800,0000,1186   ;2745           NOP
U 1186, 0000,003D,0180,0800,0000,1040   ;2746   =0      CALL,J/SHQL16
U 1187, 0000,003C,01A8,0800,0000,130D   ;2747           Q_Q.LEFT,SI/ZERO
U 130D, 0001,203C,0180,0A88,0000,1188   ;2748           R[1]_Q
U 1188, 0000,003D,0180,0800,0000,118A   ;2749   =0      CALL,J/DPT37S
U 1189, 0000,003C,0180,0800,0000,131B   ;2750           J/DPT37D                ; TEST COMPLETED
                                        ;2751   ; SUBROUTINE USED TO PERFORM TEST
                                        ;2752   =0
U 118A, 0F00,003D,0180,0800,0000,1018   ;2753   DPT37S: D_0,CALL,J/DC8          ; SET UP COUNTER.
U 118B, 0001,003C,0180,0AC0,0000,118C   ;2754           R[8]_D
U 118C, 0000,003D,0180,0800,0000,1279   ;2755   =0      ERLOOP                  ; SET UP LOOP ON ERROR
                                        ;2756                                   ; ADDRESS
U 118D, 0800,003C,0180,0A68,0000,130E   ;2757   DPT37A: D_R[OD]                 ; SET UP OPERAND
U 130E, 0001,003C,0180,09E0,0000,130F   ;2758           RC[OC]_D
U 130F, 0000,003C,01C0,0A08,0000,1310   ;2759           Q_R[1]                  ; GET EXPECTED RESULT
U 1310, 0B01,203C,0180,09F0,0000,1311   ;2760           D_D.SWAP,RC[OE]_Q               ; TEST INSTRUCTION
U 1311, 001D,2000,0180,0800,0010,1312   ;2761           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1312, 0000,013C,0180,0800,0000,118E   ;2762           Z?
U 118E, 0001,003D,0180,09E8,0000,127A   ;2763   =0      RC[OD]_D,ERROR1         ; BYTE SWAP FAILED, DMX
U 118F, 0800,003C,0180,0A68,0000,1313   ;2764           D_R[OD]                 ; COMPUTE NEXT TEST PATTERN
U 1313, 0000,003C,01C0,0A08,0000,1314   ;2765           Q_R[1]                  ; AND EXPECTED RESULT
U 1314, 0018,0038,C3A8,0800,0000,1315   ;2766           Q_Q.LEFT,SI/7,ALU_K[.FFFF]
U 1315, 0500,003C,0380,0800,0000,1316   ;2767           D_D.LEFT,SI/7
U 1316, 0001,003C,0180,0AE8,0000,1317   ;2768           R[OD]_D
U 1317, 0001,203C,0180,0A88,0000,1318   ;2769           R[1]_Q
U 1318, 0000,003C,0180,0A40,0000,1319   ;2770           LAB_R[8]                ; SEE IF LOOP COUNTER IS
```

```
U 1319, 0018,0000,0580,0AC0,0010,131A   ;2771            R[8]_LA-K[.1],CLK.UBCC  ; ZERO.
U 131A, 0000,013C,0180,0800,0000,1190   ;2772            Z?
U 1190, 0000,003C,0180,0800,0000,118D   ;2773   =0       J/DPT37A
U 1191, 0000,003E,0180,0800,0000,0001   ;2774            RETURN1                 ; IF YES RETURN
U 131B, 0000,003C,0180,0800,0000,1192   ;2775   DPT37D: NOP
```

```
                                      ;2776          .PAGE   "TEST 56        TEST USI, SHIFT INPUT, USING THE Q REGISTER"
                                      ;2777   ;***************************************************************
                                      ;2778   ;++
                                      ;2779   ; TEST  56      TEST USI, SHIFT INPUT, USING THE Q REGISTER.
                                      ;2780   ;
                                      ;2781   ; TEST DESCRIPTION
                                      ;2782   ;       EACH USI FUNCTION ON THE Q REGISETR SHIFT INPUT IS
                                      ;2783   ;       TRIED HERE. SOME OF THESE SHIFT INPUTS ARE TRIED ASSERTED
                                      ;2784   ;       AND DEASSERTED (IF APPLICABLE).
                                      ;2785   ;
                                      ;2786   ; LOGIC DESCRIPTION
                                      ;2787   ;       THIS IS A TEST OF THE Q REGISTER SHIFT INPUT
                                      ;2788   ;       MUX, THE INDIVIDUAL INPUTS TO THIS MUX AND THE MUX'S
                                      ;2789   ;       SELECT LINES. THE ACTUAL Q REGISTER SHIFT FUNCTION
                                      ;2790   ;       AND THE REGISTER'S CONNECTION TO THE MUX'S OUTPUT
                                      ;2791   ;       HAS ALREADY BEEN TESTED.
                                      ;2792   ;       THIS MUX IS LOCATED ON THE DAP BOARD AS IS THE USI
                                      ;2793   ;       AND UQK FIELD DECODE.
                                      ;2794   ;
                                      ;2795   ; ERROR DESCRIPTION
                                      ;2796   ;       EXPECTED DATA
                                      ;2797   ;       GOT DATA
                                      ;2798   ;
                                      ;2799   ;--
                                      ;2800   ;***************************************************************
                                      ;2801   =0
U 1192, 0000,003D,0180,0800,0000,1268 ;2802   DPT38:  NEWTST
U 1193, 0F00,003C,0180,0800,0000,1194 ;2803           D_0
U 1194, 0000,003D,0180,0800,0000,101A ;2804   =0      CALL,J/DCA              ; GENERATE AND SAVE THE OPERAND.
U 1195, 0001,003C,0180,0AE8,0000,131C ;2805           R[OD]_D
U 131C, 0018,0038,0980,09F8,0000,1196 ;2806           RC[OF]_K[.2]
                                      ;2807   ;///////////////////////////////////////////////////////////////
                                      ;2808   ;+
                                      ;2809   ; SUBTEST       1
                                      ;2810   ; TEST USI= 3
                                      ;2811   ;-
U 1196, 0000,003D,0180,0800,0000,127E ;2812   =0      SUBTEST
U 1197, 0000,003C,0180,0800,0000,1198 ;2813           NOP
U 1198, 0000,003D,0180,0800,0000,1279 ;2814   =0      ERLOOP
U 1199, 0800,003C,01C0,0A68,0000,131D ;2815           Q_R[OD],D_R[OD]
U 131D, 0500,003C,0180,0800,0000,131E ;2816           D_D.LEFT,SI/ZERO        ; COMPUTE EXPECTED RESULT.
U 131E, 0001,003C,01A8,09E8,0000,131F ;2817           Q_Q.LEFT,SI/ZERO,RC[OD]_D       ; TEST INSTRUCTION
U 131F, 001D,2000,0180,0800,0010,1320 ;2818           A[U_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1320, 0000,013C,0180,0800,0000,119A ;2819           Z?
U 119A, 0001,203D,0180,09E8,0000,127A ;2820   =0      RC[OD]_Q,ERROR1         ; REPORT RESULT INCORRECT.
U 119B, 0000,003C,0180,0800,0000,119C ;2821           NOP
                                      ;2822   ;///////////////////////////////////////////////////////////////
                                      ;2823   ;+
                                      ;2824   ; SUBTEST       2
                                      ;2825   ; TEST USI=4
                                      ;2826   ;-
U 119C, 0000,003D,0180,0800,0000,127E ;2827   =0      SUBTEST
U 119D, 0000,003C,0180,0800,0000,119E ;2828           NOP
U 119E, 0000,003D,0180,0800,0000,1279 ;2829   =0      ERLOOP
U 119F, 0800,003C,01C0,0A68,0000,1321 ;2830           D_R[OD],Q_R[OD]         ; SET UP OPERANDS
```

```
U 1321, 0500,003C,0180,0800,0000,1322   ;2831              D_D.LEFT,SI/ZERO          ; GENERATE THE EXPECTED RESULT
U 1322, 0001,003C,0180,09F0,0000,1323   ;2832              RC[OE]_D
U 1323, 0000,003C,0228,0800,0000,1324   ;2833              Q_Q.LEFT,SI/4             ; TEST INSTRUCTION.
U 1324, 001D,2000,0180,0800,0010,1325   ;2834              ALU_Q-D,CLK.UBCC          ; RESULT CORRECT?
U 1325, 0000,013C,0180,0800,0000,11A0   ;2835              Z?
U 11A0, 0001,203D,0180,09E8,0000,127A   ;2836      =0      RC[OD]_Q,ERROR1           ; REPORT RESULT INCORRECT.
U 11A1, 0000,003C,0180,0800,0000,11A2   ;2837              NOP
                                        ;2838      ;///////////////////////////////////////////////////////////////
                                        ;2839      ;+
                                        ;2840      ; SUBTEST      3
                                        ;2841      ; TEST USI=6
                                        ;2842      ;-
U 11A2, 0000,003D,0180,0800,0000,127E   ;2843      =0      SUBTEST
U 11A3, 0000,003C,0180,0800,0000,11A4   ;2844              NOP
U 11A4, 0000,003D,0180,0800,0000,1279   ;2845      =0      ERLOOP
U 11A5, 0800,003C,01C0,0A68,0000,1326   ;2846              D_R[OD],Q_R[OD]           ; SET UP OPERAND
U 1326, 0500,003C,0180,0800,0000,1327   ;2847              D_D.LEFT,SI/ZERO          ; COMPUTE EXPECTED RESULT
U 1327, 0001,003C,0180,09F0,0000,1328   ;2848              RC[OE]_D
U 1328, 0000,003C,0328,0800,0000,1329   ;2849              Q_Q.LEFT,SI/6             ; TEST INSTRUCTION
U 1329, 001D,2000,0180,0800,0010,132A   ;2850              ALU_Q-D,CLK.UBCC          ; RESULT CORRECT?
U 132A, 0000,013C,0180,0800,0000,11A6   ;2851              Z?
U 11A6, 0001,203D,0180,09E8,0000,127A   ;2852      =0      ERROR1,RC[OD]_Q           ; RESULT INCORRECT.
U 11A7, 0000,003C,0180,0800,0000,11A8   ;2853              NOP
                                        ;2854      ;///////////////////////////////////////////////////////////////
                                        ;2855      ;+
                                        ;2856      ; SUBTEST      4
                                        ;2857      ; TEST USI=7
                                        ;2858      ;-
U 11A8, 0000,003D,0180,0800,0000,127E   ;2859      =0      SUBTEST
U 11A9, 0000,003C,0180,0800,0000,11AA   ;2860              NOP
U 11AA, 0000,003D,0180,0800,0000,1279   ;2861      =0      ERLOOP
U 11AB, 0800,003C,01C0,0A68,0000,132B   ;2862              D_R[OD],Q_R[OD]           ; SET UP OPERAND
U 132B, 0018,0038,C180,0800,0000,132C   ;2863              ALU_K[.FFFF]
U 132C, 0500,003C,0380,0800,0000,132D   ;2864              D_D.LEFT,SI/7             ; COMPUTE EXPECTED RESULT.
U 132D, 0001,003C,0180,09F0,0000,132E   ;2865              RC[OE]_D
U 132E, 0000,003C,03A8,0800,0000,132F   ;2866              Q_Q.LEFT,SI/7             ; TEST INSTRUCTION
U 132F, 001D,2000,0180,0800,0010,1330   ;2867              ALU_Q-D,CLK.UBCC          ; RESULT CORRECT?
U 1330, 0000,013C,0180,0800,0000,11AC   ;2868              Z?
U 11AC, 0001,203D,0180,09E8,0000,127A   ;2869      =0      ERROR1,RC[OD]_Q
U 11AD, 0000,003C,0180,0800,0000,11AE   ;2870              NOP
                                        ;2871      ;///////////////////////////////////////////////////////////////
                                        ;2872      ;+
                                        ;2873      ; SUBTEST      5
                                        ;2874      ; USI=1, SHIFT Q31 INTO Q, Q31=0
                                        ;2875      ;-
U 11AE, 0000,003D,0180,0800,0000,127E   ;2876      =0      SUBTEST
U 11AF, 0000,003C,0180,0800,0000,11B0   ;2877              NOP
U 11B0, 0000,003D,0180,0800,0000,1279   ;2878      =0      ERLOOP
U 11B1, 0800,003C,01C0,0A68,0000,1331   ;2879              D_R[OD],Q_R[OD]           ; SET UP THE OPERAND
U 1331, 0500,003C,0180,0800,0000,1332   ;2880              D_D.LEFT,SI/ZERO          ; COMPUTE EXPECTED RESULT
U 1332, 0001,003C,0180,09F0,0000,1333   ;2881              RC[OE]_D
U 1333, 0000,003C,00A8,0800,0000,1334   ;2882              Q_Q.LEFT,SI/1             ; TEST INSTRUCTION
U 1334, 001D,2000,0180,0800,0010,1335   ;2883              ALU_Q-D,CLK.UBCC          ; RESULT CORRECT?
U 1335, 0000,013C,0180,0800,0000,11B2   ;2884              Z?
U 11B2, 0001,203D,0180,09E8,0000,127A   ;2885      =0      ERROR1,RC[OD]_Q           ; RESULT INCORRECT.
```

```
U 11B3, 0000,003C,0180,0800,0000,11B4   ;2886           NOP
                                        ;2887   ;//////////////////////////////////////////////////////////////
                                        ;2888   ;+
                                        ;2889   ; SUBTEST       6
                                        ;2890   ; USI=2, D31=0
                                        ;2891   ;-
U 11B4, 0000,003D,0180,0800,0000,127E   ;2892   =0      SUBTEST
U 11B5, 0000,003C,0180,0800,0000,11B6   ;2893           NOP
U 11B6, 0000,003D,0180,0800,0000,1279   ;2894   =0      ERLOOP
U 11B7, 0800,003C,01C0,0A68,0000,1336   ;2895           D_R[OD],Q_R[OD]         ; SET UP OPERAND
U 1336, 0500,003C,0180,0800,0000,1337   ;2896           D_D.LEFT,SI/ZERO        ; COMPUTE EXPECTED RESULT
U 1337, 0001,003C,0180,09F0,0000,1338   ;2897           RC[OE]_D
U 1338, 0000,003C,0128,0800,0000,1339   ;2898           Q_Q.LEFT,SI/2           ; TEST INSTRUCTION
U 1339, 001D,2000,0180,0800,0010,133A   ;2899           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 133A, 0000,013C,0180,0800,0000,11B8   ;2900           Z?
U 11B8, 0001,203D,0180,09E8,0000,127A   ;2901   =0      ERROR1,RC[OD]_Q         ; RESULT INCORRECT.
U 11B9, 0000,003C,0180,0800,0000,11BA   ;2902           NOP
                                        ;2903   ;//////////////////////////////////////////////////////////////
                                        ;2904   ;+
                                        ;2905   ; SUBTEST       7
                                        ;2906   ; USI=0, ALU CARRY 31=0
                                        ;2907   ;-
U 11BA, 0000,003D,0180,0800,0000,127E   ;2908   =0      SUBTEST
U 11BB, 0000,003C,0180,0800,0000,11BC   ;2909           NOP
U 11BC, 0000,003D,0180,0800,0000,1279   ;2910   =0      ERLOOP
U 11BD, 0800,003C,01C0,0A68,0000,133B   ;2911           D_R[OD],Q_R[OD]         ; SET UP OPERAND
U 133B, 0500,003C,0180,0800,0000,133C   ;2912           D_D.LEFT,SI/ZERO        ; COMPUTE EXPECTED RESULT
U 133C, 0001,003C,0180,09F0,0000,133D   ;2913           RC[OE]_D
                                        ;2914                                   ; TEST INSTRUCTION
U 133D, 001B,0014,1828,0800,0000,133E   ;2915           AMX/RAMX.OXT,DT/LONG,KMX/ZERO,BMX/KMX,ALU/A+B,Q_Q.LEFT,SI/0
U 133E, 001D,2000,0180,0800,0010,133F   ;2916           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 133F, 0000,013C,0180,0800,0000,11BE   ;2917           Z?
U 11BE, 0001,203D,0180,09E8,0000,127A   ;2918   =0      ERROR1,RC[OD]_Q         ; RESULT INCORRECT.
U 11BF, 0000,003C,0180,0800,0000,11C0   ;2919           NOP
                                        ;2920   ;//////////////////////////////////////////////////////////////
                                        ;2921   ;+
                                        ;2922   ; SUBTEST       8
                                        ;2923   ; USI=5, ALU CARRY 31=0
                                        ;2924   ;-
U 11C0, 0000,003D,0180,0800,0000,127E   ;2925   =0      SUBTEST
U 11C1, 0000,003C,0180,0800,0000,11C2   ;2926           NOP
U 11C2, 0000,003D,0180,0800,0000,1279   ;2927   =0      ERLOOP
U 11C3, 0800,003C,01C0,0A68,0000,1340   ;2928           D_R[OD],Q_R[OD]         ; SET UP OPERAND
U 1340, 0500,003C,0180,0800,0000,1341   ;2929           D_D.LEFT,SI/ZERO        ; COMPUTE EXPECTED RESULT
U 1341, 0001,003C,0180,09F0,0000,1342   ;2930           RC[OE]_D
                                        ;2931                                   ; TEST INSTRUCTION
U 1342, 001B,0014,1AA8,0800,0000,1343   ;2932           AMX/RAMX.OXT,DT/LONG,KMX/ZERO,BMX/KMX,ALU/A+B,Q_Q.LEFT,SI/5
U 1343, 001D,2000,0180,0800,0010,1344   ;2933           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1344, 0000,013C,0180,0800,0000,11C4   ;2934           Z?
U 11C4, 0001,203D,0180,09E8,C000,127A   ;2935   =0      ERROR1,RC[OD]_Q         ; RESULT INCORRECT.
U 11C5, 0000,003C,0180,0800,0000,11C6   ;2936           NOP
                                        ;2937   ;//////////////////////////////////////////////////////////////
                                        ;2938   ;+
                                        ;2939   ; SUBTEST       9
                                        ;2940   ; USI=1, Q31=1
                                        ;2941   ;-
U 11C6, 0000,003D,0180,0800,0000,127E   ;2942   =0      SUBTEST
U 11C7, 0000,003C,0180,0800,0000,11C8   ;2943           NOP
U 11C8, 0000,003D,0180,0800,0000,1279   ;2944   =0      ERLOOP
U 11C9, 0800,003C,01C0,0A68,0000,1345   ;2945           D_R[OD],Q_R[OD]          ; SET UP OPERAND
U 1345, 0000,003C,03B0,0800,0000,11CA   ;2946           Q_Q.RIGHT,SI/7
U 11CA, 0F00,003D,0180,0800,0000,101B   ;2947   =0      D_0,CALL,J/DCB           ; COMPUTE EXPECTED RESULT.
U 11CB, 0001,003C,0180,09F0,0000,1346   ;2948           RC[OE]_D
U 1346, 0000,003C,00A8,0800,0000,1347   ;2949           Q_Q.LEFT,SI/1            ; TEST INSTRUCTION
U 1347, 001D,2000,0180,0800,0010,1348   ;2950           ALU_Q-D,CLK.UBCC         ; RESULT CORRECT?
U 1348, 0000,013C,0180,0800,0000,11CC   ;2951           Z?
U 11CC, 0001,203D,0180,09E8,0000,127A   ;2952   =0      ERROR1,RC[OD]_Q          ; RESULT INCORRECT.
U 11CD, 0000,003C,0180,0800,0000,11CE   ;2953           NOP
                                        ;2954   ;//////////////////////////////////////////////////////////////
                                        ;2955   ;+
                                        ;2956   ; SUBTEST       A
                                        ;2957   ; USI=2, D31=1
                                        ;2958   ;-
U 11CE, 0000,003D,0180,0800,0000,127E   ;2959   =0      SUBTEST
U 11CF, 0000,003C,0180,0800,0000,11D0   ;2960           NOP
U 11D0, 0000,003D,0180,0800,0000,1279   ;2961   =0      ERLOOP
U 11D1, 0800,003C,01C0,0A68,0000,1349   ;2962           D_R[OD],Q_R[OD]          ; SET UP OPERAND
U 1349, 0018,0038,C180,0800,0000,134A   ;2963           ALU_K[.FFFF]
U 134A, 0600,003C,0380,0800,0000,134B   ;2964           D_D.RIGHT,SI/7
U 134B, 0000,003C,0128,0800,0000,134C   ;2965           Q_Q.LEFT,SI/2            ; TEST INSTRUCTION
U 134C, 0018,0038,0980,0800,0000,134D   ;2966           ALU_K[.2]
U 134D, 0100,003C,0380,0800,0000,134E   ;2967           D_D.LEFT2,SI/7           ; COMPUTE EXPECTED RESULT
U 134E, 0001,003C,0180,09F0,0000,134F   ;2968           RC[OE]_D
U 134F, 001D,2000,0180,0800,0010,1350   ;2969           ALU_Q-D,CLK.UBCC         ; RESULT CORRECT?
U 1350, 0000,013C,0180,0800,0000,11D2   ;2970           Z?
U 11D2, 0001,203D,0180,09E8,0000,127A   ;2971   =0      ERROR1,RC[OD]_Q          ; RESULT INCORRECT.
U 11D3, 0000,003C,0180,0800,0000,11D4   ;2972           NOP
                                        ;2973   ;//////////////////////////////////////////////////////////////
                                        ;2974   ;+
                                        ;2975   ; SUBTEST       B
                                        ;2976   ; USI=0, ALU CARRY 31=1
                                        ;2977   ;-
U 11D4, 0000,003D,0180,0800,0000,127E   ;2978   =0      SUBTEST
U 11D5, 0000,003C,0180,0800,0000,11D6   ;2979           NOP
U 11D6, 0000,003D,0180,0800,0000,1279   ;2980   =0      ERLOOP
U 11D7, 0F00,003C,0180,0800,0000,1351   ;2981           D_0
U 1351, 0819,0000,0580,0800,0000,1352   ;2982           D_D-K[.1]
U 1352, 0000,003C,01C0,0A68,0000,1353   ;2983           Q_R[OD]                  ; SET UP OPERAND
U 1353, 0819,0014,0428,0800,0000,1354   ;2984           D_D+K[.1],Q_Q.LEFT,SI/0  ; TEST INSTRUCTION
U 1354, 0800,003C,0180,0A68,0000,1355   ;2985           D_R[OD]                  ; COMPUTE EXPECTED RESULT
U 1355, 0018,0038,C180,0800,0000,1356   ;2986           ALU_K[.FFFF]
U 1356, 0500,003C,0380,0800,0000,1357   ;2987           D_D.LEFT,SI/7
U 1357, 0001,003C,0180,09F0,0000,1358   ;2988           RC[OE]_D
U 1358, 001D,2000,0180,0800,0010,1359   ;2989           ALU_Q-D,CLK.UBCC         ; RESULT CORRECT?
U 1359, 0000,013C,0180,0800,0000,11D8   ;2990           Z?
U 11D8, 0001,203D,0180,09E8,0000,127A   ;2991   =0      ERROR1,RC[OD]_Q          ; INCORRECT.
U 11D9, 0000,003C,0180,0800,0000,11DA   ;2992           NOP
                                        ;2993   ;//////////////////////////////////////////////////////////////
                                        ;2994   ;+
                                        ;2995   ; SUBTEST       C
```

```
                                         ;2996   ; USI=5, ALU CARRY 31=1
                                         ;2997   ;-
U 11DA, 0000,003D,0180,0800,0000,127E    ;2998   =0      SUBTEST
U 11DB, 0000,003C,0180,0800,0000,11DC    ;2999           NOP
U 11DC, 0000,003D,0180,0800,0000,1279    ;3000   =0      ERLOOP
U 11DD, 0F00,003C,0180,0800,0000,135A    ;3001           D_0
U 135A, 0819,0000,0580,0800,0000,135B    ;3002           D_D-K[.1]
U 135B, 0000,003C,01C0,0A68,0000,135C    ;3003           Q_R[OD]                       ; SET UP OPERAND
U 135C, 0819,0014,06A8,0800,0000,135D    ;3004           D_D+K[.1],Q_Q.LEFT,SI/5 ; TEST INSTRUCTION
U 135D, 0800,003C,0180,0A68,0000,135E    ;3005           D_R[OD]                       ; COMPUTE EXPECTED RESULT
U 135E, 0018,0038,C180,0800,0000,135F    ;3006           ALU_K[.FFFF]
U 135F, 0500,003C,0380,0800,0000,1360    ;3007           D_D.LEFT,SI/7
U 1360, 0001,003C,0180,09F0,0000,1361    ;3008           RC[OE]_D
U 1361, 001D,2000,0180,0800,0010,1362    ;3009           ALU_Q-D,CLK.UBCC              ; RESULT CORRECT?
U 1362, 0000,013C,0180,0800,0000,11DE    ;3010           Z?
U 11DE, 0001,203D,0180,09E8,0000,127A    ;3011   =0      ERROR1,RC[OD]_Q               ; INCORRECT.
U 11DF, 0000,003C,0180,0800,0000,11E0    ;3012           NOP
```

```
                                                .PAGE   "TEST 57        TEST USI, SHIFT INPUT, USING THE D REGISTER"
                                        ;****************************************************************
                                        ;++
                                        ; TEST  57      TEST USI, WITH D REGISTER
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       EACH USI FUNCTION ON THE D REGISTER IS TRIED HERE.
                                        ;       SOME OF THESE SHIFT INPUTS ARE TRIED BOTH ASSERTED
                                        ;       AND DEASSERTED.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS IS A TEST OF THE D REGISTER SHIFT INPUT
                                        ;       MUX, THE INDIVIDUAL INPUTS TO THIS MUX AND THE MUX'S
                                        ;       SELECT LINES. THE ACTUAL D REGISTER SHIFT FUNCTION AND THIS
                                        ;       REGISTER'S CONNECT TO THE SHIFT MUX HAS ALREADY BEEN
                                        ;       TESTED. THIS MUX IS LOCATED ON THE DAP BOARD.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED RESULT
                                        ;       GOT RESULT RESULT
                                        ;
                                        ;--
                                        ;****************************************************************
                                        =0
U 11E0, 0000,003D,0180,0800,0000,1268   DPT39:  NEWTST
U 11E1, 0018,0038,0980,09F8,0000,11E2           RC[OF]_K[.2]
U 11E2, 0F00,003D,0180,0800,0000,101A   =0      D_0,CALL,J/DCA
U 11E3, 0001,003C,01E0,0AE8,0000,11E4           R[OD]_D,Q_D
                                        ;///////////////7///7////////////////////////////////////////////
                                        ;+
                                        ; SUBTEST       1
                                        ; USI=0, Q<31>=0
                                        ;-
U 11E4, 0000,003D,0180,0800,0000,127E   =0      SUBTEST
U 11E5, 0000,003C,0180,0800,0000,11E6           NOP
U 11E6, 0000,003D,0180,0800,0000,1279   =0      ERLOOP
U 11E7, 0800,003C,01C0,0A68,0000,1363           D_R[OD],Q_R[OD]         ; SET UP THE OPERAND
U 1363, 0000,003C,01A8,0800,0000,1364           Q_Q.LEFT,SI/ZERO        ; COMPUTE EXPECTED RESULT
U 1364, 0001,203C,0180,09F0,0000,1365           RC[OE]_Q
U 1365, 0500,003C,0000,0800,0000,1366           D_D.LEFT,SI/0           ; TEST INSTRUCTION, Q31=0
U 1366, 001D,2000,0180,0800,0010,1367           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1367, 0000,013C,0180,0800,0000,11E8           Z?
U 11E8, 0001,003D,0180,09E8,0000,127A   =0      ERROR1,RC[OD]_D
U 11E9, 0000,003C,0180,0800,0000,11EA           NOP
                                        ;////////////////////////////////////////////////////////////////
                                        ;+
                                        ; SUBTEST       2
                                        ; USI=1, Q<00>=0
                                        ;-
U 11EA, 0000,003D,0180,0800,0000,127E   =0      SUBTEST
U 11EB, 0000,003C,0180,0800,0000,11EC           NOP
U 11EC, 0000,003D,0180,0800,0000,1279   =0      ERLOOP
U 11ED, 0800,003C,01C0,0A68,0000,1368           D_R[OD],Q_R[OD]         ; SET UP THE OPERAND
U 1368, 0000,003C,01A8,0800,0000,1369           Q_Q.LEFT,SI/ZERO        ; COMPUTE THE EXPECTED RESULT
U 1369, 0500,003C,0080,0800,0000,136A           D_D.LEFT,SI/1           ; TEST INSTRUCTION
```

```
U 136A, 001D,2000,0180,0800,0010,136B   ;3068           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 136B, 0000,013C,0180,0800,0000,11EE   ;3069           Z?
U 11EE, 0001,003D,0180,09E8,0000,127A   ;3070   =0      ERROR1,RC[OD]_D
U 11EF, 0000,003C,0180,0800,0000,11F0   ;3071           NOP
                                        ;3072   ;//////////////////////////////////////////////////////////////
                                        ;3073   ;+
                                        ;3074   ; SUBTEST       3
                                        ;3075   ; USI=2
                                        ;3076   ;-
U 11F0, 0000,003D,0180,0800,0000,127E   ;3077   =0      SUBTEST
U 11F1, 0000,003C,0180,0800,0000,11F2   ;3078           NOP
U 11F2, 0000,003D,0180,0800,0000,1279   ;3079   =0      ERLOOP
U 11F3, 0800,003C,01C0,0A68,0000,136C   ;3080           D_R[OD],Q_R[OD]         ; SET UP THE OPERAND
U 136C, 0000,003C,01A8,0800,0000,136D   ;3081           Q_Q.LEFT,SI/ZERO        ; COMPUTE THE EXPECTED RESULT
U 136D, 0500,003C,0100,0800,0000,136E   ;3082           D_D.LEFT,SI/2           ; TEST INSTRUCTION
U 136E, 001D,2000,0180,0800,0010,136F   ;3083           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 136F, 0000,013C,0180,0800,0000,11F4   ;3084           Z?
U 11F4, 0001,003D,0180,09E8,0000,127A   ;3085   =0      ERROR1,RC[OD]_D
U 11F5, 0000,003C,0180,0800,0000,11F6   ;3086           NOP
                                        ;3087   ;//////////////////////////////////////////////////////////////
                                        ;3088   ;+
                                        ;3089   ; SUBTEST       4
                                        ;3090   ; USI=3
                                        ;3091   ;-
U 11F6, 0000,003D,0180,0800,0000,127E   ;3092   =0      SUBTEST
U 11F7, 0000,003C,0180,0800,0000,11F8   ;3093           NOP
U 11F8, 0000,003D,0180,0800,0000,1279   ;3094   =0      ERLOOP
U 11F9, 0800,003C,01C0,0A68,0000,1370   ;3095           D_R[OD],Q_R[OD]         ; SET UP THE OPERAND
U 1370, 0000,003C,01A8,0800,0000,1371   ;3096           Q_Q.LEFT,SI/ZERO        ; COMPUTE THE EXPECTED RESULT
U 1371, 0500,003C,0180,0800,0000,1372   ;3097           D_D.LEFT,SI/ZERO        ; TEST INSTRUCTION
U 1372, 001D,2000,0180,0800,0010,1373   ;3098           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1373, 0000,013C,0180,0800,0000,11FA   ;3099           Z?
U 11FA, 0001,003D,0180,09E8,0000,127A   ;3100   =0      ERROR1,RC[OD]_D
U 11FB, 0000,003C,0180,0800,0000,11FC   ;3101           NOP
                                        ;3102   ;//////////////////////////////////////////////////////////////
                                        ;3103   ;+
                                        ;3104   ; SUBTEST       5
                                        ;3105   ; USI=4
                                        ;3106   ;-
U 11FC, 0000,003D,0180,0800,0000,127E   ;3107   =0      SUBTEST
U 11FD, 0000,003C,0180,0800,0000,11FE   ;3108           NOP
U 11FE, 0000,003D,0180,0800,0000,1279   ;3109   =0      ERLOOP
U 11FF, 0800,003C,01C0,0A68,0000,1374   ;3110           D_R[OD],Q_R[OD]         ; SET UP THE OPERAND
U 1374, 0000,003C,01A8,0800,0000,1375   ;3111           Q_Q.LEFT,SI/ZERO        ; COMPUTE THE EXPECTED RESULT
U 1375, 0500,003C,0200,0800,0000,1376   ;3112           D_D.LEFT,SI/4           ; TEST INSTRUCTION
U 1376, 001D,2000,0180,0800,0010,1377   ;3113           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1377, 0000,013C,0180,0800,0000,1200   ;3114           Z?
U 1200, 0001,003D,0180,09E8,0000,127A   ;3115   =0      ERROR1,RC[OD]_D
U 1201, 0000,003C,0180,0800,0000,1202   ;3116           NOP
                                        ;3117   ;//////////////////////////////////////////////////////////////
                                        ;3118   ;+
                                        ;3119   ; SUBTEST       6
                                        ;3120   ; USI=5, Q31=0
                                        ;3121   ;-
U 1202, 0000,003D,0180,0800,0000,127E   ;3122   =0      SUBTEST
```

```
U 1203, 0000,003C,0180,0800,0000,1204   ;3123           NOP
U 1204, 0000,003D,0180,0800,0000,1279   ;3124   =0      ERLOOP
U 1205, 0800,003C,01C0,0A68,0000,1378   ;3125           D_R[OD],Q_R[OD]         ; SET UP THE OPERAND
U 1378, 0000,003C,01A8,0800,0000,1379   ;3126           Q_Q.LEFT,SI/ZERO        ; COMPUTE THE EXPECTED RESULT
U 1379, 0001,203C,0180,0A88,0000,137A   ;3127           R[1]_Q
U 137A, 0500,003C,0280,0800,0000,137B   ;3128           D_D.LEFT,SI/5           ; TEST INSTRUCTION
U 137B, 001D,2000,0180,0800,0010,137C   ;3129           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 137C, 0000,013C,0180,0800,0000,1206   ;3130           Z?
U 1206, 0001,003D,0180,09E8,0000,127A   ;3131   =0      ERROR1,RC[OD]_D
U 1207, 0000,003C,0180,0800,0000,1208   ;3132           NOP
                                        ;3133   ;////////////////////////////////////////////////////////////////
                                        ;3134   ;+
                                        ;3135   ; SUBTEST       7
                                        ;3136   ; USI=0 Q31=1
                                        ;3137   ;-
U 1208, 0000,003D,0180,0800,0000,127E   ;3138   =0      SUBTEST
U 1209, 0000,003C,0180,0800,0000,120A   ;3139           NOP
U 120A, 0000,003D,0180,0800,0000,1279   ;3140   =0      ERLOOP
U 120B, 0800,003C,01C0,0A68,0000,137D   ;3141           D_R[OD],Q_R[OD]         ; SET UP THE OPERAND
U 137D, 0600,003C,0180,0800,0000,137E   ;3142           D_D.RIGHT,SI/ZERO
U 137E, 0000,003C,03B0,0800,0000,137F   ;3143           Q_Q.RIGHT,SI/7
U 137F, 0500,003C,0000,0800,0000,1380   ;3144           D_D.LEFT,SI/0           ; TEST INSTRUCTION
U 1380, 0000,003C,03A8,0800,0000,1381   ;3145           Q_Q.LEFT,SI/7           ; COMPUTE EXPECTED RESULT
U 1381, 0001,203C,0180,09F0,0000,1382   ;3146           RC[OE]_Q
U 1382, 001D,2000,0180,0800,0010,1383   ;3147           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1383, 0000,013C,0180,0800,0000,120C   ;3148           Z?
U 120C, 0001,003D,0180,09E8,0000,127A   ;3149   =0      ERROR1,RC[OD]_D
U 120D, 0000,003C,0180,0800,0000,120E   ;3150           NOP
                                        ;3151   ;////////////////////////////////////////////////////////////////
                                        ;3152   ;+
                                        ;3153   ; SUBTEST       8
                                        ;3154   ; USI=5, Q31=1
                                        ;3155   ;-
U 120E, 0000,003D,0180,0800,0000,127E   ;3156   =0      SUBTEST
U 120F, 0000,003C,0180,0800,0000,1210   ;3157           NOP
U 1210, 0000,003D,0180,0800,0000,1279   ;3158   =0      ERLOOP
U 1211, 0800,003C,01C0,0A68,0000,1384   ;3159           D_R[OD],Q_R[OD]         ; SET UP OPERAND
U 1384, 0600,003C,0180,0800,0000,1385   ;3160           D_D.RIGHT,SI/ZERO
U 1385, 0000,003C,03B0,0800,0000,1386   ;3161           Q_Q.RIGHT,SI/7
U 1386, 0500,003C,0000,0800,0000,1387   ;3162           D_D.LEFT,SI/0           ; TEST INSTRUCTION
U 1387, 0000,003C,03A8,0800,0000,1388   ;3163           Q_Q.LEFT,SI/7           ; COMPUTE EXPECTED RESULT
U 1388, 0001,203C,0180,09F0,0000,1389   ;3164           RC[OE]_Q
U 1389, 001D,2000,0180,0800,0010,138A   ;3165           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 138A, 0000,013C,0180,0800,0000,1212   ;3166           Z?
U 1212, 0001,003D,0180,09E8,0000,127A   ;3167   =0      ERROR1,RC[OD]_D
U 1213, 0000,003C,0180,0800,0000,1214   ;3168           NOP
                                        ;3169   ;////////////////////////////////////////////////////////////////
                                        ;3170   ;+
                                        ;3171   ; SUBTEST       9
                                        ;3172   ; USI=1, Q<00>=1
                                        ;3173   ;-
U 1214, 0000,003D,0180,0800,0000,127E   ;3174   =0      SUBTEST
U 1215, 0000,003C,0180,0800,0000,1216   ;3175           NOP
U 1216, 0000,003D,0180,0800,0000,1279   ;3176   =0      ERLOOP
U 1217, 0800,003C,01C0,0A68,0000,138B   ;3177           D_R[OD],Q_R[OD]         ; SET UP OPERAND
```

```
U 138B, 0000,003C,03A8,0800,0000,138C   ;3178            Q_Q.LEFT,SI/7           ; COMPUTE EXPECTED RESULT
U 138C, 0001,203C,0180,09F0,0000,138D   ;3179            RC[0E]_Q
U 138D, 0500,003C,0080,0800,0000,138E   ;3180            D_D.LEFT,SI/1           ; TEST INSTRUCTION
U 138E, 001D,2000,0180,0800,0010,138F   ;3181            ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 138F, 0000,013C,0180,0800,0000,1218   ;3182            Z?
U 1218, 0001,003D,0180,09E8,0000,127A   ;3183    =0      ERROR1,RC[0D]_D
U 1219, 0000,003C,0180,0800,0000,121A   ;3184            NOP
                                        ;3185    ;//////////////////////////////////////////////////////////////
                                        ;3186    ;+
                                        ;3187    ; SUBTEST       A
                                        ;3188    ; USI=6, ALU 00/01=0/0
                                        ;3189    ;-
U 121A, 0000,003D,0180,0800,0000,127E   ;3190    =0      SUBTEST
U 121B, 0000,003C,0180,0800,0000,121C   ;3191            NOP
U 121C, 0000,003D,0180,0800,0000,1279   ;3192    =0      ERLOOP
U 121D, 0800,003C,01C0,0A68,0000,1390   ;3193            D_R[0D],Q_R[0D]         ; SET UP OPERAND
U 1390, 0000,003C,0188,0800,0000,1391   ;3194            Q_Q.LEFT2,SI/ZERO       ; COMPUTE EXPECTED RESULT
U 1391, 0001,203C,0180,09F0,0000,1392   ;3195            RC[0E]_Q
U 1392, 0100,003C,0300,0800,0000,1393   ;3196            D_D.LEFT2,SI/6          ; TEST INSTRUCTION
U 1393, 001D,2000,0180,0800,0010,1394   ;3197            ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1394, 0000,013C,0180,0800,0000,121E   ;3198            Z?
U 121E, 0001,003D,0180,09E8,0000,127A   ;3199    =0      ERROR1,RC[0D]_D
U 121F, 0000,003C,0180,0800,0000,1220   ;3200            NOP
                                        ;3201    ;//////////////////////////////////////////////////////////////
                                        ;3202    ;+
                                        ;3203    ; SUBTEST       B
                                        ;3204    ; USI=6, ALU 00/01=1/1
                                        ;3205    ;-
U 1220, 0000,003D,0180,0800,0000,127E   ;3206    =0      SUBTEST
U 1221, 0000,003C,0180,0800,0000,1222   ;3207            NOP
U 1222, 0000,003D,0180,0800,0000,1279   ;3208    =0      ERLOOP
U 1223, 0800,003C,01C0,0A68,0000,1395   ;3209            D_R[0D],Q_R[0D]         ; SET UP OPERAND
U 1395, 0000,003C,0388,0800,0000,1396   ;3210            Q_Q.LEFT2,SI/7          ; COMPUTE EXPECTED RESULT
U 1396, 0001,203C,0180,09F0,0000,1397   ;3211            RC[0E]_Q
U 1397, 0100,003C,0300,0800,0000,1398   ;3212            D_D.LEFT2,SI/6          ; TEST INSTRUCTION
U 1398, 001D,2000,0180,0800,0010,1399   ;3213            ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1399, 0000,013C,0180,0800,0000,1224   ;3214            Z?
U 1224, 0001,003D,0180,09E8,0000,127A   ;3215    =0      ERROR1,RC[0D]_D
U 1225, 0000,003C,0180,0800,0000,1226   ;3216            NOP
                                        ;3217    ;//////////////////////////////////////////////////////////////
                                        ;3218    ;+
                                        ;3219    ; SUBTEST       C
                                        ;3220    ; USI=6, ALU 00/01=0/1
                                        ;3221    ;-
U 1226, 0000,003D,0180,0800,0000,127E   ;3222    =0      SUBTEST
U 1227, 0000,003C,0180,0800,0000,1228   ;3223            NOP
U 1228, 0000,003D,0180,0800,0000,1279   ;3224    =0      ERLOOP
U 1229, 0800,003C,01C0,0A68,0000,139A   ;3225            D_R[0D],Q_R[0D]         ; SET UP OPERAND
U 139A, 0000,003C,03A8,0800,0000,139B   ;3226            Q_Q.LEFT,SI/7           ; COMPUTE EXPECTED RESULT
U 139B, 0000,003C,01A8,0800,0000,139C   ;3227            Q_Q.LEFT,SI/ZERO
U 139C, 0001,203C,0180,09F0,0000,139D   ;3228            RC[0E]_Q
U 139D, 0018,0038,0580,0800,0000,139E   ;3229            ALU_K[.1]
U 139E, 0100,003C,0300,0800,0000,139F   ;3230            D_D.LEFT2,SI/6          ; TEST INSTRUCTION
U 139F, 001D,2000,0180,0800,0010,13A0   ;3231            ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 13A0, 0000,013C,0180,0800,0000,122A   ;3232            Z?
```

```
U 122A, 0001,003D,0180,09E8,0000,127A   ;3233   =0      ERROR1,RC[OD]_D
U 122B, 0000,003C,0180,0800,0000,122C   ;3234           NOP
                                        ;3235   ;///////////////////////////////////////////////////////////////
                                        ;3236   ;+
                                        ;3237   ; SUBTEST       D
                                        ;3238   ; USI=6,        ALU 00/01=1/0
                                        ;3239   ;-
U 122C, 0000,003D,0180,0800,0000,127E   ;3240   =0      SUBTEST
U 122D, 0000,003C,0180,0800,0000,122E   ;3241           NOP
U 122E, 0000,003D,0180,0800,0000,1279   ;3242   =0      ERLOOP
U 122F, 0800,003C,01C0,0A68,0000,13A1   ;3243           D_R[OD],Q_R[OD]         ; SET UP OPERAND
U 13A1, 0000,003C,01A8,0800,0000,13A2   ;3244           Q_Q.LEFT,SI/ZERO
U 13A2, 0000,003C,03A8,0800,0000,13A3   ;3245           Q_Q.LEFT,SI/7           ; COMPUTE EXPECTED RESULT
U 13A3, 0001,203C,0180,09F0,0000,13A4   ;3246           RC[OE]_Q
U 13A4, 0018,0038,0980,0800,0000,13A5   ;3247           ALU_K[.2]
U 13A5, 0100,003C,0300,0800,0000,13A6   ;3248           D_D.LEFT2,SI/6          ; TEST INSTRUCTION
U 13A6, 001D,2000,0180,0800,0010,13A7   ;3249           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 13A7, 0000,013C,0180,0800,0000,1230   ;3250           Z?
U 1230, 0001,003D,0180,09E8,0000,127A   ;3251   =0      ERROR1,RC[OD]_D
U 1231, 0000,003C,0180,0800,0000,1232   ;3252           NOP
```

```
                                                .PAGE   "TEST 58        AMX TEST"
                                        ;******************************************************************
                                        ;++
                                        ; TEST  58      AMX TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF ALL THE AMX FUNCTIONS AND INPUT
                                        ;       SELECT CONDITION EXCEPT THE LA INPUT (WHICH IS TEST
                                        ;       ELSE WHERE). EACH OF THE FUNCTIONS IS TRIED WITH
                                        ;       THE DATA PATTERNS GENERATED BY FLOATING A 1 ACROSS
                                        ;       0'S AND A 0 ACROSS 1'S.
                                        ;       SUBTEST 1 TESTS THE FUNCTION AMX/RAMX.SXT,DT/LONG.
                                        ;       SUBTEST 2 TESTS THE FUNCTION AMX/RAMX.SXT,DT/WORD.
                                        ;       SUBTEST 3 TESTS THE FUNCTION AMX/RAMX.SXT,DT/BYTE.
                                        ;       SUBTEST 4 TESTS THE FUNCTION AMX/RAMX.OXT,DT/LONG.
                                        ;       SUBTEST 5 TESTS THE FUNCTION AMX/RAMX.OXT,DT/WORD.
                                        ;       SUBTEST 6 TESTS THE FUNCTION AMX/RAMX.OXT,DT/BYTE.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS IS A TEST OF THE AMX AND THE AMX SELECTION LOGIC.
                                        ;       THE AMX SELECTION AND CONTROL LOGIC IS ON DAP. THESE
                                        ;       CONTROL SIGNALS ARE GENERATED BY BOTH THE AMX CONTROL
                                        ;       AND THE DATA TYPE FIELDS OF THE MICRO INSTRUCTION.
                                        ;       IF THE CONTROL LINES ARE NOT CORRECT THEN DAP IS
                                        ;       AT FAULT. IF THE CONTROL LINES ARE CORRECT AND AN ERROR IS
                                        ;       DETECTED THEN ONE OF THE DATA PATH BIT SLICES IS AT FAULT.
                                        ;       THE BIT SLICES ARE PARTITIONED THUS:
                                        ;               BITS <07:00>    ARE ON DCP
                                        ;               BITS <15:08>    ARE ON DDP
                                        ;               BITS <31:16>    ARE ON DEP
                                        ;       CAREFUL EXAMINATION OF THE EXPECTED AND THE RECIEVED
                                        ;       DATA SHOULD INDICATE WHICH BIT SLICE IS THE CAUSE OF THE
                                        ;       ERROR
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED RESULT
                                        ;       GOT RESULT
                                        ;       OPERAND
                                        ;       OPERATION INVOLVED WITH FAILURE AS GIVEN BY THIS TABLE:
                                        ;               5       AMX/RAMX.SXT,DT/LONG
                                        ;               4       AMX/RAMX.SXT,DT/WORD
                                        ;               3       AMX/RAMX.SXT,DT/BYTE
                                        ;               2       AMX/RAMX.OXT,DT/LONG
                                        ;               1       AMX/RAMX.OXT,DT/WORD
                                        ;               0       AMX/RAMX.OXT,DT/BYTE
                                        ;
                                        ;--
                                        ;******************************************************************
                                        =0
U 1232, 0000,003D,0180,0800,0000,1268   AMX1:   NEWTST
U 1233, 0018,0038,1180,09F8,0000,1234           RC[OF]_K[.4]
                                                                        ; SET UP TH  CONSTANTS
U 1234, 0F00,003D,0180,0800,0000,101F   =0      D_0,CALL,J/DCF          ; NEEDED TO COMPUTE EXPECTED
U 1235, 0000,003C,0180,0800,0000,1236           NOP                     ; RESULTS.
U 1236, 0000,003D,0180,0800,0000,101F   =0      CALL,J/DCF
```

```
U 1237, 0001,003C,0180,0AD8,0000,13A8   ;3308           R[0B]_D                 ; R[0B]=000000FF
U 13A8, 0801,0028,0180,0AD0,0000,13A9   ;3309           D_NOT.D,R[0A]_ALU       ; R[0A]=FFFFFF00
U 13A9, 0100,003C,0180,0800,0000,1238   ;3310           D_D.LEFT2,SI/ZERO
U 1238, 0100,003D,0180,0800,0000,1010   ;3311   =0      D_D.LEFT2,SI/ZERO,CALL,J/DC0
U 1239, 0001,003C,0180,0AC0,0000,13AA   ;3312           R[8]_D                  ; R[8]=0000FFFF
U 13AA, 0801,0028,0180,0AC8,0000,123A   ;3313           D_NOT.D,R[9]_ALU        ; R[9]=FFFF0000
U 123A, 0F00,003D,0180,0800,0000,1015   ;3314   =0      D_0,CALL,J/DC5          ; SET UP A COUNTER USED
U 123B, 0001,003C,0180,0AA8,0000,123C   ;3315           R[5]_D                  ; TO INDEX TO THE FUNCTION.
                                        ;3316   =0
U 123C, 0000,003D,0180,0800,0000,127E   ;3317   AMX2:   SUBTEST
U 123D, 0818,0038,0580,0A98,0000,123E   ;3318           D_K[.1],R[3]_K[.1]      ; INITIALIZE THE TEST PATTERN.
U 123E, 0818,0039,0980,0800,0000,1010   ;3319   =0      D_K[.2],CALL,J/DC0      ; INITIALIZE THE TEST PATTERN COUNTER.
U 123F, 0001,003C,0180,0AA0,0000,13AB   ;3320           R[4]_D                  ; R[4]=20
U 13AB, 0800,003C,0180,0A28,0000,1240   ;3321           D_R[5]                  ; GO SET UP THE LOOP ON ERROR ADDRESS
                                        ;3322                                   ; FOR THE FUNCTION NOW BEING TESTED.
U 1240, 0018,1939,1980,0AF8,0000,1070   ;3323   =0      ALU_0(K),R[0F]_ALU,CALL,D3-0?,J/AMXLPR
U 1241, 0800,003C,0180,0A28,0000,1242   ;3324   AMX4:   D_R[5]                  ; GET THE FUNCTION INDICATOR
U 1242, 0000,193D,0180,0800,0000,1078   ;3325   =0      CALL,D3-0?,J/AMXTAB     ; AND USE IT TO GET TO THE ROUTINE
                                        ;3326                                   ; USED TO SIMULATE THE FUNCTION
                                        ;3327                                   ; EXECUTE THE REAL FUNCTION
                                        ;3328                                   ; AND CHECK THE RESULT.
U 1243, 0018,0000,0580,0AA0,0010,13AC   ;3329           R[4]_LA-K[.1],CLK.UBCC  ; DECREMENT THE PATTERN COUNTER.
U 13AC, 0000,013C,0180,0800,0000,1244   ;3330           Z?
U 1244, 0800,003C,0180,0A18,0000,13AD   ;3331   =0      D_R[3],J/AMX5           ; IF NON ZERO CONTINUE.
U 1245, 0F00,003C,0180,0800,0000,1246   ;3332           D_0,J/AMX6              ; OTHERWISE GO TO CHECK THE COMPLEMENT
                                        ;3333                                   ; (0 IN 1'S) PATTERN.
U 13AD, 0500,003C,0180,0800,0000,13AE   ;3334   AMX5:   D_D.LEFT,SI/ZERO
U 13AE, 0001,003C,0180,0A98,0000,1241   ;3335           R[3]_D,J/AMX4
                                        ;3336   =0
U 1246, 0818,0039,0980,0800,0000,1010   ;3337   AMX6:   D_K[.2],CALL,J/DC0      ; SET UP A PATTERN COUNTER.
U 1247, 0001,003C,0180,0AA0,0000,13AF   ;3338           R[4]_D                  ; R[4]=20
U 13AF, 0F00,003C,0180,0800,0000,13B0   ;3339           D_0
U 13B0, 0819,0000,0580,0800,0000,13B1   ;3340           D_D-K[.1]               ; SET UP THE TEST PATTERN
U 13B1, 0500,003C,0180,0800,0000,13B2   ;3341           D_D.LEFT,SI/ZERO
U 13B2, 0001,003C,0180,0A98,0000,13B3   ;3342           R[3]_D                  ; R[3]=FFFFFFFE
U 13B3, 0800,003C,0180,0A28,0000,1248   ;3343   AMX7:   D_R[5]                  ; GET THE FUNCTION INDICATOR
U 1248, 0000,193D,0180,0800,0000,1078   ;3344   =0      CALL,D3-0?,J/AMXTAB     ; AND USE IT TO GO TO THE
                                        ;3345                                   ; SUBROUTINE WHICH WILL
                                        ;3346                                   ; FIRST SIMULATE THE FUNCTION
                                        ;3347                                   ; THEN EXECUTE IT AND CHECK THE
                                        ;3348                                   ; RESULT.
U 1249, 0018,0000,0580,0AA0,0010,13B4   ;3349           R[4]_LA-K[.1],CLK.UBCC  ; DECREMENT THE COUNTER AND SEE
U 13B4, 0000,013C,0180,0800,0000,124A   ;3350           Z?                      ; IF IT IS ZERO.
U 124A, 0800,003C,0180,0A18,0000,13B6   ;3351   =0      D_R[3],J/AMX8           ; IF NOT CONTINUE WITH THIS FUNCTION.
U 124B, 0000,003C,0180,0A28,0010,13B5   ;3352           ALU_R[5],CLK.UBCC       ; ELSE HAVE ALL FUNCTIONS BEEN TESTED?
U 13B5, 0000,013C,0180,0800,0000,124C   ;3353           Z?,J/AMX9
U 13B6, 0018,0038,C180,0800,0000,13B7   ;3354   AMX8:   ALU_K[.FFFF]
U 13B7, 0500,003C,0380,0800,0000,13B8   ;3355           D_D.LEFT,SI/7
U 13B8, 0001,003C,0180,0A98,0000,13B3   ;3356           R[3]_D,J/AMX7
                                        ;3357   =0
U 124C, 0018,0000,0580,0AA8,0000,123C   ;3358   AMX9:   R[5]_LA-K[.1],J/AMX2    ; IF ALL FUNCTIONS NOT YET
                                        ;3359                                   ; TESTED DECREMENT FUNCTION
                                        ;3360                                   ; INDICATOR AND TEST NEXT
                                        ;3361                                   ; FUNCTION.
U 124D, 0000,003C,0180,0800,0000,13ED   ;3362           J/AMX10                 ; DONE.
```

```
                                         ;/////////////////////////////////////////////////////////////////
                                         ;+
                                         ; SUBTEST       1
                                         ; AMX_RAMX SXT[L]
                                         ;-
                                         =0
U 124E, 0000,003D,0180,0800,0000,1279    LPRA:   ERLOOP
U 124F, 0800,003C,0180,0A78,0000,13B9            D_R[OF]                    ; SEE IF THIS WAS A CALL TO
U 13B9, 0000,0D3C,0180,0800,0000,1005            SIGNS?                     ; SET THE LOOP ON ERR ADDRESS
U 1005, 0018,003A,C180,0AF8,0000,0001    =101    R[OF]_K[.FFFF],RETURN1     ; OR DID AN ERROR ACTUALLY OCCUR
                                                                            ; AND THE LOOP ON ERROR OPTION
                                                                            ; WAS SELECTED BY THE USER.
U 1007, 0800,003C,01C0,0A18,0000,13BA            D_R[3],Q_R[3]              ; SET UP THE OPERANDS.
U 13BA, 0001,003C,0180,0A88,0000,13BB    AMXA:   R[1]_D                     ; SAVE THE OPERAND.
                                                                            ; AND EXECUTE THE FUNCTION.
U 13BB, 0002,003C,01C0,0800,0000,13BC    AMXA1:  RAMX/D,AMX/RAMX.SXT,DT/LONG,ALU/A,Q_ALU
U 13BC, 0001,203C,0180,0A90,0000,13BD            R[2]_Q
U 13BD, 001D,2000,0180,0800,0010,13BE            ALU_Q-D,CLK.UBCC           ; WAS THE RESULT CORRECT?
U 13BE, 0000,013C,0180,0800,0000,1250            Z?
U 1250, 0000,003C,0180,0800,0000,13E4    =0      J/AMXER                    ; IF INCORRECT GO REPORT ERROR.
U 1251, 0000,003E,0180,0A20,0000,0001            LAB_R[4],RETURN1           ; OTHERWISE RETURN, RESULT CORRECT.
                                         ;/////////////////////////////////////////////////////////////////
                                         ;+
                                         ; SUBTEST       2
                                         ; AMX_RAMX SXT[W]
                                         ;-
                                         =0
U 1252, 0000,003D,0180,0800,0000,1279    LPRB:   ERLOOP
U 1253, 0800,003C,0180,0A78,0000,13BF            D_R[OF]                    ; SEE IF THIS WAS A CALL TO
U 13BF, 0000,0D3C,0180,0800,0000,100D            SIGNS?                     ; SET UP THE LOOP ON ERROR ADDRESS
U 100D, 0018,003A,C180,0AF8,0000,0001    =101    R[OF]_K[.FFFF],RETURN1     ; OR IF AN ERROR ACTUALLY OCCURRED
U 100F, 0800,003C,01C0,0A18,0000,1254            D_R[3],Q_R[3]              ; AND THE USER HAD SELECTED THE
                                                                            ; LOOP ON ERROR OPTION.
                                         =0
U 1254, 0B00,003D,0180,0800,0000,1010    AMXB:   D_D.SWAP,CALL,J/DC0        ; TEST D<15> TO COMPUTE THE EXPECTED
U 1255, 0100,003C,0180,0800,0000,13C0            D_D.LEFT2,SI/ZERO          ; SIGN EXTENDED RESULT.
U 13C0, 0100,003C,0180,0800,0000,13C1            D_D.LEFT2,SI/ZERO
U 13C1, 0000,0D3C,0180,0800,0000,1046            D31?
U 1046, 001C,0034,01C0,0A48,0000,13C2    =110    LAB_R[9],ALU_LA[AND]Q,Q_ALU,J/AMXB1
U 1047, 001C,0030,01C0,0A40,0000,13C2            LAB_R[8],ALU_LA[OR]Q,Q_ALU
U 13C2, 0001,203C,0180,0A88,0000,13C3    AMXB1:  R[1]_Q                     ; SAVE EXPECTED RESULT.
U 13C3, 0800,003C,0180,0A18,0000,13C4            D_R[3]                     ; SET UP OPERAND.
                                                                            ; AND EXECUTE THE FUNCTION.
U 13C4, 0802,403C,0180,0800,0000,13C5            RAMX/D,AMX/RAMX.SXT,DT/WORD,ALU/A,D_ALU
U 13C5, 0001,003C,0180,0A90,0000,13C6            R[2]_D                     ; SAVE THE ACTUAL RESULT.
U 13C6, 001D,2000,0180,0800,0010,13C7            ALU_Q-D,CLK.UBCC           ; RESULT CORRECT.
U 13C7, 0000,013C,0180,0800,0000,1256            Z?
U 1256, 0000,003C,0180,0800,0000,13E4    =0      J/AMXER                    ; IF NOT THEN REPORT ERROR.
U 1257, 0000,003E,0180,0A20,0000,0001            LAB_R[4],RETURN1           ; ELSE RETURN.
                                         ;/////////////////////////////////////////////////////////////////
                                         ;+
                                         ; SUBTEST       3
                                         ; AMX_RAMX SXT[B]
                                         ;-
                                         =0
```

```
U 1258, 0000,003D,0180,0800,0000,1279   ;3418   LPRC:   ERLOOP
U 1259, 0800,003C,0180,0A78,0000,13C8   ;3419           D_R[OF]                 ; WAS THIS A CALL TO SET
U 13C8, 0000,0D3C,0180,0800,0000,104D   ;3420           SIGNS?                  ; THE LOOP ON ERROR ADDRESS OR
U 104D, 0018,003A,C180,0AF8,0000,0001   ;3421   =101    R[OF]_K[.FFFF],RETURN1  ; DID AN ERROR ACTUALLY OCCUR
                                        ;3422                                   ; WITH THE LOOP ON ERROR
                                        ;3423                                   ; OPTION SELECTED BY THE USER.
U 104F, 0800,003C,01C0,0A18,0000,13C9   ;3424           D_R[3],Q_R[3]           ; SET UP THE OPERAND.
U 13C9, 0800,003C,0180,0800,0000,13CA   ;3425   AMXC:   D_D.SWAP                ; COMPUTE THE EXPECTED RESULT.
U 13CA, 0000,0D3C,0180,0800,0000,1056   ;3426           D31?
U 1056, 001C,0034,01C0,0A58,0000,13CB   ;3427   =110    LAB_R[0B],ALU_LA[AND]Q,Q_ALU,J/AMXC1
U 1057, 001C,0030,01C0,0A50,0000,13CB   ;3428           LAB_R[0A],ALU_LA[OR]Q,Q_ALU
U 13CB, 0001,203C,0180,0A88,0000,13CC   ;3429   AMXC1:  R[1]_Q                  ; SAVE THE EXPECTED RESULT.
U 13CC, 0800,003C,0180,0A18,0000,13CD   ;3430           D_R[3]                  ; SET UP THE OPERAND
                                        ;3431                                   ; AND EXECUTE THE FUNCTION.
U 13CD, 0802,803C,0180,0800,0000,13CE   ;3432           RAMX/D,AMX/RAMX.SXT,DT/BYTE,ALU/A,D_ALU
U 13CE, 0001,003C,0180,0A90,0000,13CF   ;3433           R[2]_D                  ; SAVE THE RESULT.
U 13CF, 001D,2000,0180,0800,0010,13D0   ;3434           ALU_Q-D,CLK.UBCC        ; WAS IT CORRECT?
U 13D0, 0000,013C,0180,0800,0000,125A   ;3435           Z?
U 125A, 0000,003C,0180,0800,0000,13E4   ;3436   =0      J/AMXER                 ; IF INCORRECT REPORT ERROR.
U 125B, 0000,003E,0180,0A20,0000,0001   ;3437           LAB_R[4],RETURN1        ; OTHERWISE RETURN.
                                        ;3438   ;/////////7////////////////////////////////
                                        ;3439   ;+
                                        ;3440   ; SUBTEST       4
                                        ;3441   ; AMX_0, AMX_RAMX.OXT=0
                                        ;3442   ;-
                                        ;3443   =0
U 125C, 0000,003D,0180,0800,0000,1279   ;3444   LPRD:   ERLOOP
U 125D, 0800,003C,0180,0A78,0000,13D1   ;3445           D_R[OF]                 ; WAS THIS A CALL TO SET THE
U 13D1, 0000,0D3C,0180,0800,0000,105D   ;3446           SIGNS?                  ; LOOP ON ERROR ADDRESS OR DID
U 105D, 0018,003A,C180,0AF8,0000,0001   ;3447   =101    R[OF]_K[.FFFF],RETURN1  ; AN ERROR ACTUALLY OCCUR
                                        ;3448                                   ; WHILE THE USER HAD THE
                                        ;3449                                   ; LOOP ON ERROR OPTION SELECTED.
U 105F, 0800,003C,01C0,0A18,0000,13D2   ;3450           D_R[3],Q_R[3]           ; SET UP THE OPERAND.
U 13D2, 0000,003C,01F8,0800,0000,13D3   ;3451   AMXD:   Q_0                     ; EXPECTED RESULT IS 0.
U 13D3, 0001,203C,0180,0A88,0000,13D4   ;3452           R[1]_Q
                                        ;3453                                   ; EXECUTE THE FUNCTION.
U 13D4, 0003,003C,0180,0A90,0010,13D5   ;3454           RAMX/D,AMX/RAMX.OXT,DT/LONG,ALU/A,R[2]_ALU,CLK.UBCC
U 13D5, 0000,013C,0180,0800,0000,125E   ;3455           Z?                      ; AND TEST THE RESULT.
U 125E, 0000,003C,0180,0800,0000,13E4   ;3456   =0      J/AMXER                 ; IF INCORRECT REPORT ERROR.
U 125F, 0000,003E,0180,0A20,0000,0001   ;3457           LAB_R[4],RETURN1        ; OTHERWISE RETURN.
                                        ;3458   ;/////////7////////////////////////////////
                                        ;3459   ;+
                                        ;3460   ; SUBTEST       5
                                        ;3461   ; AMX_RAMX OXT[W]
                                        ;3462   ;-
                                        ;3463   =0
U 1260, 0000,003D,0180,0800,0000,1279   ;3464   LPRE:   ERLOOP
U 1261, 0800,003C,0180,0A78,0000,13D6   ;3465           D_R[OF]                 ; WAS THIS A CALL TO SET
U 13D6, 0000,0D3C,0180,0800,0000,1065   ;3466           SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 1065, 0018,003A,C180,0AF8,0000,0001   ;3467   =101    R[OF]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY
                                        ;3468                                   ; OCCUR WHILE THE USER HAD
                                        ;3469                                   ; THE LOOP ON ERROR OPTION
                                        ;3470                                   ; SELECTED.
U 1067, 0800,003C,01C0,0A18,0000,13D7   ;3471           D_R[3],Q_R[3]           ; SET UP THE OPERAND.
U 13D7, 001C,2034,01C0,0A48,0000,13D8   ;3472   AMXE:   LAB_R[9],ALU_LA[AND]D,Q_ALU ; AND COMPUTE THE EXPECTED RESULT.
```

```
U 13D8, 0001,203C,0180,0A88,0000,13D9   ;3473            R[1]_Q                     ; SAVE THE EXPECTED RESULT.
                                        ;3474                                       ; EXECUTE THE FUNCTION.
U 13D9, 0803,403C,0180,0800,0000,13DA   ;3475    AMXE1:  RAMX/D,AMX/RAMX.OXT,DT/WORD,ALU/A,D_ALU
U 13DA, 0001,003C,0180,0A90,0000,13DB   ;3476            R[2]_D                     ; SAVE THE ACTUAL RESULT.
U 13DB, 001D,2000,0180,0800,0010,13DC   ;3477            ALU_Q-D,CLK.UBCC           ; WAS IT CORRECT?
U 13DC, 0000,013C,0180,0800,0000,1262   ;3478            Z?
U 1262, 0000,003C,0180,0800,0000,13E4   ;3479    =0      J/AMXER                    ; IF INCORRECT REPORT THE ERROR.
U 1263, 0000,003E,0180,0A20,0000,0001   ;3480            LAB_R[4],RETURN1           ; OTHERWISE RETURN.
                                        ;3481    ;///////////////////////////////////////////////////////////////////
                                        ;3482    ;+
                                        ;3483    ; SUBTEST       6
                                        ;3484    ; AMX_RAMX OXT[B]
                                        ;3485    ;-
                                        ;3486    =0
U 1264, 0000,0C3D,0180,0800,0000,1279   ;3487    LPRF:   ERLOOP
U 1265, 0800,003C,0180,0A78,0000,13DD   ;3488            D_R[OF]                    ; WAS THIS A CALL TO SET UP THE
U 13DD, 0000,0D3C,0180,0800,0000,106D   ;3489            SIGNS?                     ; LOOP ON ERROR ADDRESS OR
U 106D, 0018,003A,C180,0AF8,0000,0001   ;3490    =101    R[OF]_K[.FFFF],RETURN1     ; DID AN ERROR ACTUALLY OCCUR WHILE
                                        ;3491                                       ; THE USER HAD THE LOOP ON ERROR
                                        ;3492                                       ; OPTION SELECTED.
U 106F, 0800,003C,01C0,0A18,0000,13DE   ;3493            D_R[3],Q_R[3]              ; SET UP THE OPERAND.
U 13DE, 001C,2034,01C0,0A58,0000,13DF   ;3494    AMXF:   LAB_R[OB],ALU_LA[AND]D,Q_ALU ; COMPUTE THE EXPECTED RESULT.
U 13DF, 0001,203C,0180,0A88,0000,13E0   ;3495            R[1]_Q                     ; AND SAVE IT.
                                        ;3496                                       ; EXECUTE THE FUNCTION.
U 13E0, 0803,803C,0180,0800,0000,13E1   ;3497    AMXF1:  RAMX/D,AMX/RAMX.OXT,DT/BYTE,ALU/A,D_ALU
U 13E1, 0001,003C,0180,0A90,0000,13E2   ;3498            R[2]_D                     ; SAVE THE ACTUAL RESULT AND
U 13E2, 001D,2000,0180,0800,0010,13E3   ;3499            ALU_Q-D,CLK.UBCC           ; SEE IF IT WAS CORRECT.
U 13E3, 0000,013C,0180,0800,0000,1266   ;3500            Z?
U 1266, 0000,003C,0180,0800,0000,13E4   ;3501    =0      J/AMXER                    ; IF INCORRECT REPORT ERROR.
U 1267, 0000,003E,0180,0A20,0000,0001   ;3502            LAB_R[4],RETURN1           ; OTHERWISE RETURN.
                                        ;3503    ; NOTE THAT WHEN AN ERROR OCCURS:
                                        ;3504    ;       RC[OE] = EXPECTED RESULT
                                        ;3505    ;       RC[OD] = GOT RESULT
                                        ;3506    ;       RC[OC] = OPERAND
                                        ;3507    ;       RC[OB] = OPERATION INVOLVED FOLLOWING THE
                                        ;3508    ;                CONVENTION
                                        ;3509    ;       5       AMX/RAMX.SXT,DT/LONG
                                        ;3510    ;       4       AMX/RAMX.SXT,DT/WORD
                                        ;3511    ;       3       AMX/RAMX.SXT,DT/BYTE
                                        ;3512    ;       2       AMX/RAMX.OXT,DT/LONG
                                        ;3513    ;       1       AMX/RAMX.OXT,DT/WORD
                                        ;3514    ;       0       AMX/RAMX.OXT,DT/BYTE
                                        ;3515    ;
                                        ;3516    ; THESE VALUES (OF RC[OE] THROUGH RC[OB]) WILL BE DISPLAYED
                                        ;3517    ; WHEN AN ERROR OCCURS.
U 13E4, 0000,003C,0180,0A08,0000,13E5   ;3518    AMXER:  LAB_R[1]
U 13E5, 0000,003C,0180,09F0,0000,13E6   ;3519            RC[OE]_LA
U 13E6, 0000,003C,0180,0A10,0000,13E7   ;3520            LAB_R[2]
U 13E7, 0000,003C,0180,09E8,0000,13E8   ;3521            RC[OD]_LA
U 13E8, 0000,003C,0180,0A18,0000,13E9   ;3522            LAB_R[3]
U 13E9, 0000,003C,0180,09E0,0000,13EA   ;3523            RC[OC]_LA
U 13EA, 0000,003C,0180,0A28,0000,13EB   ;3524            LAB_R[5]
U 13EB, 0000,003C,0180,09D8,0000,13EC   ;3525            RC[OB]_LA
U 13EC, 0000,003D,0180,0800,0000,127A   ;3526            ERROR1
                                        ;3527    ; THIS TABLE IS USED TO INDEX TO THE APPROPRIATE
                                        ;3528   ; ROUTINE TO SET UP THE LOOP ON ERROR ADDRESS FOR A PARTICULAR
                                        ;3529   ; FUNCTION.
                                        ;3530   =000
U 1070, 0000,003C,0180,0800,0000,1264   ;3531   AMXLPR: J/LPRF
U 1071, 0000,003C,0180,0800,0000,1260   ;3532           J/LPRE
U 1072, 0000,003C,0180,0800,0000,125C   ;3533           J/LPRD
U 1073, 0000,003C,0180,0800,0000,1258   ;3534           J/LPRC
U 1074, 0000,003C,0180,0800,0000,1252   ;3535           J/LPRB
U 1075, 0000,003C,0180,0800,0000,124E   ;3536           J/LPRA
                                        ;3537   =
                                        ;3538   ; THIS TABLE IS USED TO INDEX TO THE APPROPRIATE ROUTINE TO
                                        ;3539   ; EXECUTE THE PARTICULAR FUNCTION BEING TESTED AND CHECK THE RESULT.
                                        ;3540   =000
U 1078, 0800,003C,01C0,0A18,0000,13DE   ;3541   AMXTAB: D_R[3],Q_R[3],J/AMXF
U 1079, 0800,003C,01C0,0A18,0000,13D7   ;3542           D_R[3],Q_R[3],J/AMXE
U 107A, 0800,003C,01C0,0A18,0000,13D2   ;3543           D_R[3],Q_R[3],J/AMXD
U 107B, 0800,003C,01C0,0A18,0000,13C9   ;3544           D_R[3],Q_R[3],J/AMXC
U 107C, 0800,003C,01C0,0A18,0000,1254   ;3545           D_R[3],Q_R[3],J/AMXB
U 107D, 0800,003C,01C0,0A18,0000,13BA   ;3546           D_R[3],Q_R[3],J/AMXA
                                        ;3547   =
U 13ED, 0000,003C,0180,0800,0000,13EE   ;3548   AMX10:  NOP
U 13EE, 0000,003D,0180,0800,0000,1268   ;3549   DUMMY4: NEWTST
```

```
;                             Location / Line Number Index

;Location         0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - OFFF Unused
U 1000            1871:    1838     1845=    1861=    1839     3372=    1840     3375=
U 1008            1862=    1863=    1972=    1973=    1841     3393=    1842     3394=
U 1010            1951=    1952=    1953=    1954=    1955=    1956=    1957=    1958=
U 1018            1959=    1960=    1961=    1962=    1963=    1964=    1965=    1966=
U 1020            1995=    1996=    1997=    1998=    1999=    2000=    2001=    2002=
U 1028            2003=    2004=    2005=    2006=    2007=    2008=    2009=    2010=
U 1030            2013=    2014=    2015=    2016=    2017=    2018=    2019=    2020=
U 1038            2021=    2022=    2023=    2024=    2025=    2026=    2027=    2028=
U 1040            1983=    1984=    2032=    2033=    2035=    2036=    3401=    3402=
U 1048            2038=    2039=    2072=    2073=    1843     3421=    1900:    3424=
U 1050            2074=    2075=    2076=    2077=    2079=    2080=    3427=    3428=
U 1058            2081=    2082=    1903:    1844     1864     3447=    1906:    3450=
U 1060            2083=    2084=    2086=    2087=    1865     3467=    1866     3471=
U 1068            2093=    2094=    2097=    2098=    1867     3490=    1868     3493=
U 1070            3531=    3532=    3533=    3534=    3535=    3536=    2131=    2132=
U 1078            3541=    3542=    3543=    3544=    3545=    3546=    2133=    2134=
U 1080            2135=    2136=    2139=    2140=    2141=    2142=    2143=    2144=
U 1088            2146=    2147=    2154=    2155=    2158=    2159=    2199=    2200=
U 1090            2202=    2203=    2204=    2205=    2206=    2207=    2208=    2209=
U 1098            2210=    2211=    2212=    2213=    2214=    2215=    2216=    2217=
U 10A0            2218=    2220=    2222=    2223=    2224=    2225=    2227=    2228=
U 10A8            2229=    2230=    2231=    2232=    2233=    2234=    2235=    2236=
U 10B0            2237=    2238=    2239=    2240=    2241=    2242=    2243=    2244=
U 10B8            2246=    2247=    2253=    2254=    2294=    2295=    2296=    2297=
U 10C0            2299=    2300=    2301=    2302=    2303=    2304=    2305=    2306=
U 10C8            2307=    2308=    2309=    2310=    2311=    2312=    2313=    2314=
U 10D0            2315=    2317=    2319=    2320=    2321=    2322=    2323=    2324=
U 10D8            2326=    2327=    2328=    2329=    2330=    2331=    2332=    2333=
U 10E0            2334=    2335=    2336=    2337=    2338=    2339=    2340=    2341=
U 10E8            2342=    2343=    2345=    2346=    2352=    2353=    2389=    2390=
U 10F0            2391=    2392=    2393=    2394=    2396=    2397=    2399=    2400=
U 10F8            2406=    2407=    2408=    2409=    2411=    2412=    2414=    2415=
U 1100            1825:    1826:    1827:    1828:    1829:    1830:    1831:    1832:
U 1108            1833:    1869     2417=    2418=    1834:    1835:    1836:    1837:
U 1110            2424=    2425=    2427=    2428=    2434=    2435=    2437=    2438=
U 1118            2446=    2447=    2449=    2450=    2452=    2453=    2489=    2490
U 1120            2492=    2493=    2494=    2495=    2497=    2498=    2500=    2501=
U 1128            2506=    2507=    2508=    2509=    2511=    2512=    2514=    2515=
U 1130            2517=    2518=    2524=    2525=    2527=    2528=    2534=    2535=
U 1138            2537=    2538=    2546=    2547=    2550=    2551=    2553=    2554=
U 1140            2578=    2579=    2591=    2592=    2595=    2597=    2598=    2599=
U 1148            2600=    2601=    2607=    2608=    2609=    2610=    2611=    2612=
U 1150            2618=    2619=    2621=    2622=    1870     1926:    2623=    2624=
U 1158            2630=    2631=    2634=    2635=    2638=    2639=    2640=    2641=
U 1160            2648=    2649=    2658=    2659=    2684=    2685=    2697=    2698=
U 1168            2699=    2700=    2701=    2702=    2705=    2706=    2707=    2708=
U 1170            2709=    2710=    2716=    2717=    2718=    2719=    2720=    2721=
U 1178            2727=    2728=    2729=    2730=    2731=    2732=    2733=    2734=
U 1180            2735=    2736=    2742=    2743=    2744=    2745=    2746=    2747=
U 1188            2749=    2750=    2753=    2754=    2755=    2757=    2763=    2764=
U 1190            2773=    2774=    2802=    2803=    2804=    2805=    2812=    2813=
U 1198            2814=    2815=    2820=    2821=    2827=    2828=    2829=    2830=
;Location         0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0            2836=   2837=   2843=   2844=   2845=   2846=   2852=   2853=
U 11A8            2859=   2860=   2861=   2862=   2869=   2870=   2876=   2877=
U 11B0            2878=   2879=   2885=   2886=   2892=   2893=   2894=   2895=
U 11B8            2901=   2902=   2908=   2909=   2910=   2911=   2918=   2919=
U 11C0            2925=   2926=   2927=   2928=   2935=   2936=   2942=   2943=
U 11C8            2944=   2945=   2947=   2948=   2952=   2953=   2959=   2960=
U 11D0            2961=   2962=   2971=   2972=   2978=   2979=   2980=   2981=
U 11D8            2991=   2992=   2998=   2999=   3000=   3001=   3011=   3012=
U 11E0            3037=   3038=   3039=   3040=   3046=   3047=   3048=   3049=
U 11E8            3055=   3056=   3062=   3063=   3064=   3065=   3070=   3071=
U 11F0            3077=   3078=   3079=   3080=   3085=   3086=   3092=   3093=
U 11F8            3094=   3095=   3100=   3101=   3107=   3108=   3109=   3110=
U 1200            3115=   3116=   3122=   3123=   3124=   3125=   3131=   3132=
U 1208            3138=   3139=   3140=   3141=   3149=   3150=   3156=   3157=
U 1210            3158=   3159=   3167=   3168=   3174=   3175=   3176=   3177=
U 1218            3183=   3184=   3190=   3191=   3192=   3193=   3199=   3200=
U 1220            3206=   3207=   3208=   3209=   3215=   3216=   3222=   3223=
U 1228            3224=   3225=   3233=   3234=   3240=   3241=   3242=   3243=
U 1230            3251=   3252=   3302=   3303=   3305=   3306=   3307=   3308=
U 1238            3311=   3312=   3314=   3315=   3317=   3318=   3319=   3320=
U 1240            3323=   3324=   3325=   3329=   3331=   3332=   3337=   3338=
U 1248            3344=   3349=   3351=   3352=   3358=   3362=   3369=   3370=
U 1250            3382=   3383=   3390=   3391=   3397=   3398=   3410=   3411=
U 1258            3418=   3419=   3436=   3437=   3444=   3445=   3456=   3457=
U 1260            3464=   3465=   3479=   3480=   3487=   3488=   3501=   3502=
U 1268            1880    1881    1882    1883    1884    1885    1886    1887
U 1270            1888    1889    1890    1891    1892    1893    1894    1895
U 1278            1896    1897    1898    1899    1901    1902    1934    1935
U 1280            1941    1942    1943    1946    1947    1948    1949    1967
U 1288            1968    1969    1974    1975    1976    1977    1978    1979
U 1290            1980    1985    1986    1987    1988    1989    1990    1991
U 1298            1992    2037    2085    2088    2089    2090    2091    2092
U 12A0            2095    2096    2137    2138    2145    2148    2149    2150
U 12A8            2151    2152    1927:   2153    2156    2157    2221    2245
U 12B0            2248    2249    2250    2251    2252    2318    2344    2347
U 12B8            2348    2349    2350    2351    2398    2401    2402    2403
U 12C0            2404    2405    2410    2416    2419    2420    2421    2422
U 12C8            2423    2426    2429    2430    2431    2432    2433    2436
U 12D0            2439    2440    2441    2442    2443    2444    2445    2448
U 12D8            2451    2491    2499    2502    2503    2504    2505    2510
U 12E0            2516    2519    2520    2521    2522    2523    2526    2529
U 12E8            2530    2531    2532    2533    2536    2539    2540    2541
U 12F0            2542    2543    2544    2545    2548    2549    2552    2593
U 12F8            2594    2620    2632    2633    2642    2643    2644    2645
U 1300            2646    2647    2650    2651    2652    2653    2654    2655
U 1308            2656    2657    2660    2703    2704    2748    2758    2759
U 1310            2760    2761    2762    2765    2766    2767    2768    2769
U 1318            2770    2771    2772    2775    2806    2816    2817    2818
U 1320            2819    2831    2832    2833    2834    2835    2847    2848
U 1328            2849    2850    2851    2863    2864    2865    2866    2867
U 1330            2868    2880    2881    2882    2883    2884    2896    2897
U 1338            2898    2899    2900    2912    2913    2915    2916    2917
U 1340            2929    2930    2932    2933    2934    2946    2949    2950
```

```
;Location         0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348            2951    2963    2964    2965    2966    2967    2968    2969
U 1350            2970    2982    2983    2984    2985    2986    2987    2988
U 1358            2989    2990    3002    3003    3004    3005    3006    3007
U 1360            3008    3009    3010    3050    3051    3052    3053    3054
U 1368            3066    3067    3068    3069    3081    3082    3083    3084
U 1370            3096    3097    3098    3099    3111    3112    3113    3114
U 1378            3126    3127    3128    3129    3130    3142    3143    3144
U 1380            3145    3146    3147    3148    3160    3161    3162    3163
U 1388            3164    3165    3166    3178    3179    3180    3181    3182
U 1390            3194    3195    3196    3197    3198    3210    3211    3212
U 1398            3213    3214    3226    3227    3228    3229    3230    3231
U 13A0            3232    3244    3245    3246    3247    3248    3249    3250
U 13A8            3309    3310    3313    3321    3330    3334    3335    3339
U 13B0            3340    3341    3342    3343    3350    3353    3354    3355
U 13B8            3356    3371    3376    3378    3379    3380    3381    3392
U 13C0            3399    3400    3403    3404    3406    3407    3408    3409
U 13C8            3420    3425    3426    3429    3430    3432    3433    3434
U 13D0            3435    3446    3451    3452    3454    3455    3466    3472
U 13D8            3473    3475    3476    3477    3478    3489    3494    3495
U 13E0            3497    3498    3499    3500    3518    3519    3520    3521
U 13E8            3522    3523    3524    3525    3526    3548    3549
U 13F0            1910:   1911:   1912:   1913:   1914:   1915:   1916:   1917:
U 13F8            1918:   1919:   1920:   1921:   1922:   1923:   1924:   1925:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH21       1023

Used            1023
Remaining

Total microwords used in memory U: 1023
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH21.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

; 3 Control ROM Field Definitions
; 548 Register Transfer Macro Definitions
; 1413 Non-transfer Functions
; 1485 Branch Enable Macro Definitions
; 1564 MICRO DIAGNOSTIC DEFINED MACROS
; 1806 MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2139 TEST 59 ALU TEST
; 2782 TEST 5A PSL REGISTER DATA INTEGRITY
; 2876 TEST 5B ALU/A+B+PSL.C TEST
; 2942 TEST 5C SK ROM CHECKSUM TEST
; 3082 TEST 5D DFMX AND SHF MUX TEST

```
;1        .NOLIST
;1804     .LIST
;1805
```

```
                                                  .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                          .REGION/1000,13FF
                                          ;+
                                          ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                          ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                          ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                          ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                          ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                          ;
                                          ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                          ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                          ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                          ;       R[OF] AND DO A RETURN0.
                                          ;
                                          ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                          ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                          ; TO THE CONSOLE.
                                          ;
                                          ;-
U 1100, 0000,003C,1980,0800,0084,7003     1100:   SC_K[ZERO],J/TRPH1        ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001     1101:   SC_K[.1],J/TRPH0          ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001     1102:   SC_K[.2],J/TRPH0          ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001     1103:   SC_K[.3],J/TRPH0          ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001     1104:   SC_K[.4],J/TRPH0          ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001     1105:   SC_K[.6],J/TRPH0          ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001     1106:   SC_K[.9],J/TRPH0          ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001     1107:   SC_K[.7],J/TRPH0          ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001     1108:   SC_K[.8],J/TRPH0          ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003     110C:   SC_K[.C],J/TRPH1          ; RDS
U 110D, 0000,003C,8980,0800,0084,7003     110D:   SC_K[.D],J/TRPH1          ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001     110E:   SC_K[.10],J/TRPH0         ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003     110F:   SC_K[.F],J/TRPH1          ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,1004     TRPH0:  Q_ID[USTACK]
U 1004, 0C00,003C,01E0,0800,0000,1006             Q_D,D_Q
U 1006, 0000,003C,8180,3C00,0000,1044             ID[USTACK]_D
U 1044, 0C00,003C,01E0,0800,0000,1046             Q_D,D_Q
U 1046, 0000,003C,01C0,0A78,0000,104C             Q_R[OF]
U 104C, 0001,2024,0180,0800,0010,1054             ALU_Q.ANDNOT.MASK,CLK.UBCC       ; WAS TRAP EXPECTED?
U 1054, 0000,013C,0180,0800,0000,1002             Z?                               ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000     =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
                                          ;+
                                          ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                          ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                          ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                          ;
                                          ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                          ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                          ;             FAULT STATUS REGISTER
                                          ;             SBI ERROR REGISTER
                                          ;             TIMEOUT ADDRESS REGISTER
                                          ;             MAINTENANCE REGISTER
                                          ;             CACHE PARITY REGISTER
                                          ;             TB ERROR REGISTER 1
                                          ;             TB ERROR REGISTER 0
                                          ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,1008   ;1861   TRPH1:  RC[0D]_SC
U 1008, 0000,003D,D980,0800,0084,71DC   ;1862   =0      SETRCF[.9]
U 1009, 0000,003C,49F0,2C00,0000,1056   ;1863           Q_ID[TBER0]
U 1056, 0001,203C,4DF0,2DB0,0000,105B   ;1864           RC[6]_Q,Q_ID[TBER1]
U 105B, 0001,203C,65F0,2DB8,0000,105C   ;1865           RC[7]_Q,Q_ID[SBI.ERR]
U 105C, 0001,203C,6DF0,2DD8,0000,10D4   ;1866           RC[0B]_Q,Q_ID[FAULT]
U 10D4, 0001,203C,75F0,2DE0,0000,10D6   ;1867           RC[0C]_Q,Q_ID[MAINT]
U 10D6, 0001,203C,79F0,2DC8,0000,10E4   ;1868           RC[9]_Q,Q_ID[PARITY]
U 10E4, 0001,203C,69F0,2DC0,0000,10E6   ;1869           RC[8]_Q,Q_ID[TIME.ADDR]
U 10E6, 0001,203C,81F0,2DD0,0000,1000   ;1870           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,11C4   ;1871   1000:   RC[0E]_Q,ERROR1
                                        ;1872   ;+
                                        ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1875   ;                 NEWTST
                                        ;1876   ;                 ERLOOP
                                        ;1877   ;                 ERROR1
                                        ;1878   ;                 ERROR2
                                        ;1879   ;
U 10F4, 0000,003C,65F8,0800,0084,70F6   ;1880   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 10F6, 0818,0038,8D80,0800,0000,1109   ;1881           D_K[.1F]                        ; ...
U 1109, 0D00,003C,0180,0800,0000,1114   ;1882           D_DAL.SC
U 1114, 0000,003C,3D80,3C00,0000,1116   ;1883           ID[PSL]_D                       ; WRITE THE PSL
U 1116, 0818,0038,0580,0800,0000,1124   ;1884           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 1124, 0D00,003C,0180,0800,0000,1126   ;1885           D_DAL.SC
U 1126, 0F00,003C,3180,3C00,0000,1134   ;1886           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 1134, 0000,003C,5D80,3C00,0000,1136   ;1887           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 1136, 0000,003C,3980,3C00,0000,1154   ;1888           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 1154, 0000,003C,2980,3C00,0000,115C   ;1889           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 115C, 0000,003C,4980,3C00,0000,115E   ;1890           ID[TBER0]_D                     ; SHUT OFF THE TB
U 115E, 0818,0038,C180,0800,0000,119C   ;1891           D_K[.FFFF]
U 119C, 0000,003C,6580,3C00,0000,119E   ;1892           ID[SBI.ERR]_D
U 119E, 0F00,003C,6D80,3C00,0000,11AC   ;1893           ID[FAULT]_D,D_0
U 11AC, 0000,003C,6D80,3C00,0000,11AE   ;1894           ID[FAULT]_D
U 11AE, 0000,003C,6580,3C00,0000,11B4   ;1895           ID[SBI.ERR]_D
U 11B4, 0003,003C,0180,09F0,0000,11B6   ;1896           RC[0E]_0
U 11B6, 0003,003C,0180,0AF8,0000,11BC   ;1897           R[0F]_0
U 11BC, 0003,003C,0180,09E8,0000,105E   ;1898           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 11BE, 0818,0038,0980,0800,0000,105E   ;1899   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 11C4, 0810,0038,0180,0978,0000,11C6   ;1900   ERROR1: D_RC[0F]
U 11C6, 0819,0034,4D80,0800,0000,104E   ;1901           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1902   104E:   D_D.OR.K[.4],J/CALLCON
U 11CC, 0810,0038,0180,0978,0000,11CE   ;1903   ERROR2: D_RC[0F]
U 11CE, 0819,0034,4D80,0800,0000,105A   ;1904           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1905   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1906   105E:
                                        ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1908           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1909   ;+
                                        ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1912   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1913   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1914   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1915   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,11D4   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 11D4, 0810,0038,4D80,0978,0000,11D6   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 11D6, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 11DC, 0010,0038,01C0,0978,0000,11DE   ;1943   SETRCF: Q_RC[OF]
U 11DE, 0019,2034,4DC0,0800,0000,124D   ;1944           Q_Q.AND.K[.FF00]
U 124D, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946
                                        ;1947   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 124E, 0118,0038,1B80,0800,0000,1252   ;1948   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 124F, 0118,0038,0B80,0800,0000,1252   ;1949   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1250, 0118,0038,0780,0800,0000,1252   ;1950   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 1251, 0118,0038,C380,0800,0000,1252   ;1951   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
                                        ;1952   =0000
U 1010, 0018,0038,1980,0800,0000,124E   ;1953   DC0:    ALU_0(K),J/S00
U 1011, 0018,0038,1980,0800,0000,124F   ;1954   DC1:    ALU_0(K),J/S01
U 1012, 0018,0038,1980,0800,0000,1250   ;1955   DC2:    ALU_0(K),J/S10
U 1013, 0018,0038,1980,0800,0000,1251   ;1956   DC3:    ALU_0(K),J/S11
U 1014, 0018,0038,0980,0800,0000,124E   ;1957   DC4:    ALU_K[.2],J/S00
U 1015, 0018,0038,0980,0800,0000,124F   ;1958   DC5:    ALU_K[.2],J/S01
U 1016, 0018,0038,0980,0800,0000,1250   ;1959   DC6:    ALU_K[.2],J/S10
U 1017, 0018,0038,0980,0800,0000,1251   ;1960   DC7:    ALU_K[.2],J/S11
U 1018, 0018,0038,0580,0800,0000,124E   ;1961   DC8:    ALU_K[.1],J/S00
U 1019, 0018,0038,0580,0800,0000,124F   ;1962   DC9:    ALU_K[.1],J/S01
U 101A, 0018,0038,0580,0800,0000,1250   ;1963   DCA:    ALU_K[.1],J/S10
U 101B, 0018,0038,0580,0800,0000,1251   ;1964   DCB:    ALU_K[.1],J/S11
U 101C, 0018,0038,C180,0800,0000,124E   ;1965   DCC:    ALU_K[.FFFF],J/S00
U 101D, 0018,0038,C180,0800,0000,124F   ;1966   DCD:    ALU_K[.FFFF],J/S01
U 101E, 0018,0038,C180,0800,0000,1250   ;1967   DCE:    ALU_K[.FFFF],J/S10
U 101F, 0018,0038,C180,0800,0000,1251   ;1968   DCF:    ALU_K[.FFFF],J/S11
U 1252, 0100,003E,0380,0800,0000,0001   ;1969   SX:     D_D.LEFT2,SI/7,RETURN1
U 1253, 0018,0038,01C0,0800,0000,100A   ;1970   DC.6:   Q_K[.8]
```

```
                                            ;1971   =0
U 100A, 0000,003D,0180,0800,0000,1016       ;1972   DC.6A:  CALL,J/DC6
U 100B, 0019,2000,05C0,0800,0010,1254       ;1973           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1254, 0000,013C,0180,0800,0000,100C       ;1974           Z?
U 100C, 0000,003C,0180,0800,0000,100A       ;1975   =0      J/DC.6A
U 100D, 0000,003E,0180,0800,0000,0001       ;1976           RETURN1
U 1255, 0018,0038,0580,0800,0000,1256       ;1977   DCAAAA: ALU_K[.1]
U 1256, 0118,0038,0780,0800,0000,1257       ;1978           ALU_K[.1],D_D.LEFT2,SI/7
U 1257, 0118,0038,0780,0800,0000,1258       ;1979           ALU_K[.1],D_D.LEFT2,SI/7
U 1258, 0118,0038,0780,0800,0000,1259       ;1980           ALU_K[.1],D_D.LEFT2,SI/7
U 1259, 0118,0038,0780,0800,0000,125A       ;1981           ALU_K[.1],D_D.LEFT2,SI/7
U 125A, 0118,0038,0780,0800,0000,125B       ;1982           ALU_K[.1],D_D.LEFT2,SI/7
U 125B, 0118,0038,0780,0800,0000,125C       ;1983           ALU_K[.1],D_D.LEFT2,SI/7
U 125C, 0118,0038,0780,0800,0000,125D       ;1984           ALU_K[.1],D_D.LEFT2,SI/7
U 125D, 0100,003E,0380,0800,0000,0001       ;1985           D_D.LEFT2,SI/7,RETURN1
U 125E, 0018,0038,0980,0800,0000,125F       ;1986   DRAAAA: ALU_K[.2]
U 125F, 0218,0038,0B80,0800,0000,1260       ;1987           ALU_K[.2],D_D.RIGHT2,SI/7
U 1260, 0218,0038,0B80,0800,0000,1261       ;1988           ALU_K[.2],D_D.RIGHT2,SI/7
U 1261, 0218,0038,0B80,0800,0000,1262       ;1989           ALU_K[.2],D_D.RIGHT2,SI/7
U 1262, 0218,0038,0B80,0800,0000,1263       ;1990           ALU_K[.2],D_D.RIGHT2,SI/7
U 1263, 0218,0038,0B80,0800,0000,1264       ;1991           ALU_K[.2],D_D.RIGHT2,SI/7
U 1264, 0218,0038,0B80,0800,0000,1265       ;1992           ALU_K[.2],D_D.RIGHT2,SI/7
U 1265, 0218,0038,0B80,0800,0000,1266       ;1993           ALU_K[.2],D_D.RIGHT2,SI/7
U 1266, 0200,003E,0380,0800,0000,0001       ;1994           D_D.RIGHT2,SI/7,RETURN1
U 1267, 0F00,003C,0180,0800,0000,1268       ;1995   DC.NF:  D_0
U 1268, 0819,0000,0580,0800,0000,1010       ;1996           D_D-K[.1],J/DC0
                                            ;1997   ; THIS TABLE IS ISED AS A TARGET TO TEST  BRANCHES.
                                            ;1998   ; NOTE THAT IT RETURNS BY RETURN2 IF Q IS
                                            ;1999   ; ZERO AFTER EXECUTION, OR RETURNS BY RETURN1 IF Q IS NON ZERO.
                                            ;2000   =0000
U 1020, 0019,2000,05C0,0800,0000,1021       ;2001   BRTBLE: Q_Q-K[.1]
U 1021, 0019,2000,05C0,0800,0000,1022       ;2002           Q_Q-K[.1]
U 1022, 0019,2000,05C0,0800,0000,1023       ;2003           Q_Q-K[.1]
U 1023, 0019,2000,05C0,0800,0000,1024       ;2004           Q_Q-K[.1]
U 1024, 0019,2000,05C0,0800,0000,1025       ;2005           Q_Q-K[.1]
U 1025, 0019,2000,05C0,0800,0000,1026       ;2006           Q_Q-K[.1]
U 1026, 0019,2000,05C0,0800,0000,1027       ;2007           Q_Q-K[.1]
U 1027, 0019,2000,05C0,0800,0000,1028       ;2008           Q_Q-K[.1]
U 1028, 0019,2000,05C0,0800,0000,1029       ;2009   BRT1:   Q_Q-K[.1]
U 1029, 0019,2000,05C0,0800,0000,102A       ;2010           Q_Q-K[.1]
U 102A, 0019,2000,05C0,0800,0000,102B       ;2011           Q_Q-K[.1]
U 102B, 0019,2000,05C0,0800,0000,102C       ;2012           Q_Q-K[.1]
U 102C, 0019,2000,05C0,0800,0000,102D       ;2013   BRT2:   Q_Q-K[.1]
U 102D, 0019,2000,05C0,0800,0000,102E       ;2014           Q_Q-K[.1]
U 102E, 0019,2000,05C0,0800,0000,102F       ;2015           Q_Q-K[.1]
U 102F, 0001,203C,0180,0800,0010,1269       ;2016           ALU_Q,CLK.UBCC
U 1269, 001D,2114,01C0,0800,0000,1040       ;2017           Z?,ALU_Q+D,Q_ALU
U 1040, 0000,003E,0180,0800,0000,0001       ;2018   =0      RETURN1
U 1041, 0000,003E,0180,0800,0000,0002       ;2019           RETURN2
                                            ;2020   ; THESE SUBROUTINES ARE USED TO SHIFT ZEROES INTO THE Q REGISTER.
                                            ;2021   =0
U 1042, 0000,003D,0180,0800,0000,126A       ;2022   SHQLFT16:       CALL,J/SHQLFT8
U 1043, 0000,003C,0180,0800,0000,126A       ;2023           J/SHQLFT8
U 126A, 0000,003C,01A8,0800,0000,126B       ;2024   SHQLFT8:        Q_Q.LEFT,SI/3
U 126B, 0000,003C,01A8,0800,0000,126C       ;2025   SHQLFT7:        Q_Q.LEFT,SI/3
```

```
U 126C, 0000,003C,01A8,0800,0000,126D   ;2026           Q_Q.LEFT,SI/3
U 126D, 0000,003C,01A8,0800,0000,126E   ;2027           Q_Q.LEFT,SI/3
U 126E, 0000,003C,01A8,0800,0000,126F   ;2028           Q_Q.LEFT,SI/3
U 126F, 0000,003C,01A8,0800,0000,1270   ;2029           Q_Q.LEFT,SI/3
U 1270, 0000,003C,01A8,0800,0000,1271   ;2030           Q_Q.LEFT,SI/3
U 1271, 0000,003E,01A8,0800,0000,0001   ;2031           Q_Q.LEFT,SI/3,RETURN1
                                        ;2032   ; THESE SUBROUTINES ARE USED TO SHIFT 1'S INTO THE Q REGISTE.
                                        ;2033   =0
U 1048, 0000,003D,0180,0800,0000,1272   ;2034   SHQL16: CALL,J/SHQL8
U 1049, 0000,003C,0180,0800,0000,1272   ;2035           J/SHQL8
U 1272, 0000,003C,03A8,0800,0000,1273   ;2036   SHQL8:  Q_Q.LEFT,SI/7
U 1273, 0000,003C,03A8,0800,0000,1274   ;2037   SHC 7:  Q_Q.LEFT,SI/7
U 1274, 0000,003C,03A8,0800,0000,1275   ;2038           Q_Q.LEFT,SI/7
U 1275, 0000,003C,03A8,0800,0000,1276   ;2039           Q_Q.LEFT,SI/7
U 1276, 0000,003C,03A8,0800,0000,1277   ;2040           Q_Q.LEFT,SI/7
U 1277, 0000,003C,03A8,0800,0000,1278   ;2041           Q_Q.LEFT,SI/7
U 1278, 0000,003C,03A8,0800,0000,1279   ;2042           Q_Q.LEFT,SI/7
U 1279, 0000,003E,03A8,0800,0000,0001   ;2043           Q_Q.LEFT,SI/7,RETURN1
                                        ;2044   ; THESE TABLES ARE USED TO WRITE THE RA AND RB SCRATCH PADS.
                                        ;2045   =0000
U 1030, 0001,203E,0180,0A80,0000,0001   ;2046   WRRARB: R[0]_Q,RETURN1
U 1031, 0001,203E,0180,0A88,0000,0001   ;2047           R[1]_Q,RETURN1
U 1032, 0001,203E,0180,0A90,0000,0001   ;2048           R[2]_Q,RETURN1
U 1033, 0001,203E,0180,0A98,0000,0001   ;2049           R[3]_Q,RETURN1
U 1034, 0001,203E,0180,0AA0,0000,0001   ;2050           R[4]_Q,RETURN1
U 1035, 0001,203E,0180,0AA8,0000,0001   ;2051           R[5]_Q,RETURN1
U 1036, 0001,203E,0180,0AB0,0000,0001   ;2052           R[6]_Q,RETURN1
U 1037, 0001,203E,0180,0AB8,0000,0001   ;2053           R[7]_Q,RETURN1
U 1038, 0001,203E,0180,0AC0,0000,0001   ;2054           R[8]_Q,RETURN1
U 1039, 0001,203E,0180,0AC8,0000,0001   ;2055           R[9]_Q,RETURN1
U 103A, 0001,203E,0180,0AD0,0000,0001   ;2056           R[0A]_Q,RETURN1
U 103B, 0001,203E,0180,0AD8,0000,0001   ;2057           R[0B]_Q,RETURN1
U 103C, 0001,203E,0180,0AE0,0000,0001   ;2058           R[0C]_Q,RETURN1
U 103D, 0001,203E,0180,0AE8,0000,0001   ;2059           R[0D]_Q,RETURN1
U 103E, 0001,203E,0180,0AF0,0000,0001   ;2060           R[0E]_Q,RETURN1
U 103F, 0001,203E,0180,0AF8,0000,0001   ;2061           R[0F]_Q,RETURN1
                                        ;2062   ; THESE TABLES ARE USED TO WRITE Q INTO THE RC SCRATCH PADS.
                                        ;2063   =0000
U 1060, 0001,203E,0180,0980,0000,0001   ;2064   WRRC:   RC[0]_Q,RETURN1
U 1061, 0001,203E,0180,0988,0000,0001   ;2065           RC[1]_Q,RETURN1
U 1062, 0001,203E,0180,0990,0000,0001   ;2066           RC[2]_Q,RETURN1
U 1063, 0001,203E,0180,0998,0000,0001   ;2067           RC[3]_Q,RETURN1
U 1064, 0001,203E,0180,09A0,0000,0001   ;2068           RC[4]_Q,RETURN1
U 1065, 0001,203E,0180,09A8,0000,0001   ;2069           RC[5]_Q,RETURN1
U 1066, 0001,203E,0180,09B0,0000,0001   ;2070           RC[6]_Q,RETURN1
U 1067, 0001,203E,0180,09B8,0000,0001   ;2071           RC[7]_Q,RETURN1
U 1068, 0001,203E,0180,09C0,0000,0001   ;2072           RC[8]_Q,RETURN1
U 1069, 0001,203E,0180,09C8,0000,0001   ;2073           RC[9]_Q,RETURN1
U 106A, 0001,203E,0180,09D0,0000,0001   ;2074           RC[0A]_Q,RETURN1
U 106B, 0001,203E,0180,09D8,0000,0001   ;2075           RC[0B]_Q,RETURN1
U 106C, 0001,203E,0180,09E0,0000,0001   ;2076           RC[0C]_Q,RETURN1
U 106D, 0001,203E,0180,09E8,0000,0001   ;2077           RC[0D]_Q,RETURN1
U 106E, 0001,203E,0180,09F0,0000,0001   ;2078           RC[0E]_Q,RETURN1
U 106F, 0001,203E,0180,09F8,0000,0001   ;2079           RC[0F]_Q,RETURN1
                                        ;2080   ; THESE ARE USED TO READ THE RA AND RB SCRATCH PADS
```

```
                                          ;2081   ; INTO LA AND LB.
                                          ;2082   =0000
U 1070, 0000,003E,0180,0A00,0000,0001     ;2083   LTCHAB: LAB_R[0],RETURN1
U 1071, 0000,003E,0180,0A08,0000,0001     ;2084           LAB_R[1],RETURN1
U 1072, 0000,003E,0180,0A10,0000,0001     ;2085           LAB_R[2],RETURN1
U 1073, 0000,003E,0180,0A18,0000,0001     ;2086           LAB_R[3],RETURN1
U 1074, 0000,003E,0180,0A20,0000,0001     ;2087           LAB_R[4],RETURN1
U 1075, 0000,003E,0180,0A28,0000,0001     ;2088           LAB_R[5],RETURN1
U 1076, 0000,003E,0180,0A30,0000,0001     ;2089           LAB_R[6],RETURN1
U 1077, 0000,003E,0180,0A38,0000,0001     ;2090           LAB_R[7],RETURN1
U 1078, 0000,003E,0180,0A40,0000,0001     ;2091           LAB_R[8],RETURN1
U 1079, 0000,003E,0180,0A48,0000,0001     ;2092           LAB_R[9],RETURN1
U 107A, 0000,003E,0180,0A50,0000,0001     ;2093           LAB_R[0A],RETURN1
U 107B, 0000,003E,0180,0A58,0000,0001     ;2094           LAB_R[0B],RETURN1
U 107C, 0000,003E,0180,0A60,0000,0001     ;2095           LAB_R[0C],RETURN1
U 107D, 0000,003E,0180,0A68,0000,0001     ;2096           LAB_R[0D],RETURN1
U 107E, 0000,003E,0180,0A70,0000,0001     ;2097           LAB_R[0E],RETURN1
U 107F, 0000,003E,0180,0A78,0000,0001     ;2098           LAB_R[0F],RETURN1
                                          ;2099   ; THESE ARE USED TO READ THE RC SCRATCH PADS INTO LC.
                                          ;2100   =0000
U 1080, 0000,003E,0180,0900,0000,0001     ;2101   LTCHRC: LC_RC[0],RETURN1
U 1081, 0000,003E,0180,0908,0000,0001     ;2102           LC_RC[1],RETURN1
U 1082, 0000,003E,0180,0910,0000,0001     ;2103           LC_RC[2],RETURN1
U 1083, 0000,003E,0180,0918,0000,0001     ;2104           LC_RC[3],RETURN1
U 1084, 0000,003E,0180,0920,0000,0001     ;2105           LC_RC[4],RETURN1
U 1085, 0000,003E,0180,0928,0000,0001     ;2106           LC_RC[5],RETURN1
U 1086, 0000,003E,0180,0930,0000,0001     ;2107           LC_RC[6],RETURN1
U 1087, 0000,003E,0180,0938,0000,0001     ;2108           LC_RC[7],RETURN1
U 1088, 0000,003E,0180,0940,0000,0001     ;2109           LC_RC[8],RETURN1
U 1089, 0000,003E,0180,0948,0000,0001     ;2110           LC_RC[9],RETURN1
U 108A, 0000,003E,0180,0950,0000,0001     ;2111           LC_RC[0A],RETURN1
U 108B, 0000,003E,0180,0958,0000,0001     ;2112           LC_RC[0B],RETURN1
U 108C, 0000,003E,0180,0960,0000,0001     ;2113           LC_RC[0C],RETURN1
U 108D, 0000,003E,0180,0968,0000,0001     ;2114           LC_RC[0D],RETURN1
U 108E, 0000,003E,0180,0970,0000,0001     ;2115           LC_RC[0E],RETURN1
U 108F, 0000,003E,0180,0978,0000,0001     ;2116           LC_RC[0F],RETURN1
                                          ;2117   ; THIS ROUTINE IS USED TO FILL ALL RA AND RB WITH THE
                                          ;2118   ; CONTENTS OF Q.
                                          ;2119   =0
U 104A, 0F00,003D,0180,0800,0000,1267     ;2120   RARB.Q: D_0,CALL,J/DC.NF
U 104B, 0000,003C,0180,0800,0000,1050     ;2121           NOP
                                          ;2122   =0
U 1050, 0000,193D,0180,0800,0000,1030     ;2123   RARB.QA:        CALL,D3-0?,J/WRRARB
U 1051, 0819,0014,0580,0800,0010,127A     ;2124           D_D+K[.1],CLK.UBCC
U 127A, 0000,013C,0180,0800,0000,1052     ;2125           Z?
U 1052, 0000,003C,0180,0800,0000,1050     ;2126   =0      J/RARB.QA
U 1053, 0000,003E,0180,0800,0000,0001     ;2127           RETURN1
                                          ;2128   ; THIS ROUTINE IS USED TO FILL ALL RC WITH THE
                                          ;2129   ; CONTENTS OF Q.
                                          ;2130   =0
U 1058, 0F00,003D,0180,0800,0000,1267     ;2131   RC.Q:   D_0,CALL,J/DC.NF
U 1059, 0000,003C,0180,0800,0000,1090     ;2132           NOP
                                          ;2133   =0
U 1090, 0000,193D,0180,0800,0000,1060     ;2134   RC.QA:  CALL,D3-0?,J/WRRC
U 1091, 0819,0014,0580,0800,0010,127B     ;2135           D_D+K[.1],CLK.UBCC
```

```
U 127B, 0000,013C,0180,0800,0000,1094   ;2136            Z?
U 1094, 0000,003C,0180,0800,0000,1090   ;2137    =0      J/RC.QA
U 1095, 0000,003E,0180,0800,0000,0001   ;2138            RETURN1
```

```
        .PAGE   "TEST 59        ALU TEST"
;*************************************************************
;++
; TEST  59      ALU TEST
;
; TEST DESCRIPTION
;       THIS IS A TEST OF THE DATA PATH ALU. ALL
;       ALU FUNCTIONS ARE TEST EXCEPT A-B AND A+B (WHICH
;       ARE TESTED IN THE HARDCORE) AND THOSE FUNCTIONS
;       WHICH ARE ACCESSABLE ONLY THROUGH THE
;       SELECTION OF INSTRUCTION BUFFER DEPENDENT ALU
;       FUNCTION. TEST PATTERNS ARE GENERATED IN SUCH
;       A WAY AS TO GENERATE EVERY POSSIBLE COMBINATIONS
;       OF A<3:0> AND B<3:0> AND CIN FOR EACH 4 BIT SLICE
;       ALU CHIP.
;       SUBTEST 1 TESTS BEN ALU C31
;       SUBTEST 2 TESTS THE FUNCTION A
;       SUBTEST 3 TESTS THE FUNCTION B
;       SUBTEST 4 TESTS THE FUNCTION NOT.A
;       SUBTEST 5 TESTS THE FUNCTION A.OR.B
;       SUBTEST 6 TESTS THE FUNCTION A.AND.B
;       SUBTEST 7 TESTS THE FUNCTION A.ORNOT.B
;       SUBTEST 8 TESTS THE FUNCTION A.ANDNOT.B
;       SUBTEST 9 TESTS THE FUNCTION A.XOR.B
;       SUBTEST A TESTS THE FUNCTION A-B-1
;       SUBTEST B TESTS THE FUNCTION A+B+1
;       SUBTEST C TESTS THE FUNCTION A-B(RLOG)
;       SUBTEST D TESTS THE FUNCTION A+B(RLOG)
;
; LOGIC DESCRIPTION
;       TESTED HERE ARE ALL THE ALU FUNCTIONS EXCEPT A-B
;       AND A+B (THESE HAVE BEEN TESTED IN THE HARDCORE
;       TESTS) AND THE FUNCTION ONLY ACCESSABLE THROUGH
;       USING AN INSTRUCTION DEPENDENT OPERATION. NOTE THAT
;       ONLY THE RESULT OF A.MINUS.B (RLOG) AND A.PLUS.B (RLOG)
;       ON THE ALU ARE CHECKED. THE RLOG STACK ITSELF IS TESTED
;       LATER.
;       IF A FAILURE OCCURS BECAUSE THE CONTROL LINES WHICH SELECT
;       THE ALU FUNCTION OR THE ALU CARRY IN TO ALU <00> ARE INCORRECT
;       THEN DAP IS AT FAULT. OTHERWISE THE BIT SLICE DATA PATH MODULE
;       WHICH IS INCORRECT IS AT FAULT. THE BIT SLICES ARE DIVIDED THUS:
;               BITS <07:00>    ARE ON DCP
;               BITS <15:08>    ARE ON DDP
;               BITS <31:16>    ARE ON DEP
;       ANOTHER POSSIBILITY, ONLY WHEN EXECUTING AN ALU ADD OR SUB
;       IS THAT THE CARRY LOOK AHEAD LOGIC HAS FAILED. THIS LOGIC IS LOCATED
;       ON THE DCP MODULE.
;
; ERROR DESCRIPTION
;       EXPECTED RESULT
;       GOT RESULT
;       A OPERAND
;       B OPERAND
;       ALU FUNCTION BEING TESTED AS GIVEN BY:
;               OC      A+B **NOT BEING TESTED,BUT USED IN SUBTEST
```

```
                                          ;2194    ;                              1 FOR BEN ALU C31 TEST**
                                          ;2195    ;                 0B      A
                                          ;2196    ;                 0A      B
                                          ;2197    ;                 09      NOT.A
                                          ;2198    ;                 08      A.OR.B
                                          ;2199    ;                 07      A.AND.B
                                          ;2200    ;                 06      A.ORNOT.B
                                          ;2201    ;                 05      A.ANDNOT.B
                                          ;2202    ;                 04      A.XOR.B
                                          ;2203    ;                 03      A-B-1
                                          ;2204    ;                 02      A+B+1
                                          ;2205    ;                 01      A-B (RLOG)
                                          ;2206    ;                 00      A+B (RLOG)
                                          ;2207    ;         ERROR CODE AS GIVEN BY:
                                          ;2208    ;                 0       NO CARRY OUT OF ALU 31 WHEN ONE WAS EXPECTED
                                          ;2209    ;                 1       CARRY OUT OF ALU 31 WHEN ONE WAS *NOT* EXPECTED
                                          ;2210    ;                 2       NOT A CARRY OUT ERROR
                                          ;2211    ;
                                          ;2212    ;--
                                          ;2213    ;*****************************************************************
                                          ;2214    ; THESE REGISTERS HAVE THE FOLLOWING SIGNIFICANCE DURING THIS
                                          ;2215    ; TEST:
                                          ;2216    ;         R1=EXP RES
                                          ;2217    ;         R2=GOT RES
                                          ;2218    ;         R3=A PAT
                                          ;2219    ;         R4=B PAT
                                          ;2220    ;         R5=INCREMENT
                                          ;2221    ;         R6=ACNT
                                          ;2222    ;         R7=BCNT
                                          ;2223    ;         R8=SHF CNT
                                          ;2224    ;         R9=FUNCNT
                                          ;2225    ;         RF=FLAG:        ERROR=0
                                          ;2226    ;                         LOOPERR=0
                                          ;2227    ;         R0A=TMP'S
                                          ;2228    ;         R0B
                                          ;2229    ;         R0C=TMP FLAG
                                          ;2230    ;         R0D=TMPCNT
                                          ;2231    ;         R0E=CONSTANT 32 (DEC)
                                          ;2232    =0
U 1098, 0000,003D,0180,0800,0000,10F4     ;2233    ALUTST: NEWTST
U 1099, 0018,0038,D580,09F8,0000,109A     ;2234            RC[0F]_K[.6]
                                          ;2235    ;///////////7//////////////////////////////////////////////////////
                                          ;2236    ;+
                                          ;2237    ; SUBTEST 1
                                          ;2238    ;         BEN ALU C31 TEST
                                          ;2239    ;         **THIS SUBTEST IS COMPLETELY INDEPENDENT OF THE OTHER ROUTINES
                                          ;2240    ;         (SIMULATIONS, CONSTANTS, ETC.) WITHIN THIS TEST.**
                                          ;2241    ;-
                                          ;2242    =0
U 109A, 0000,003D,0180,0800,0000,11D4     ;2243    ALUCDE: SUBTEST
U 109B, 0018,0038,8580,09D0,0000,127C     ;2244            RC[0A]_K[.C]             ; ERROR DATA FUNCTION
U 127C, 0F00,003C,3DF0,2C00,0000,127D     ;2245            Q_ID[PSL],D_0            ; SAVE PSL WITH C-BIT CLEAR
U 127D, 0001,203C,0180,0980,0000,127E     ;2246            RC[0]_Q
U 127E, 0819,2014,0580,0800,0000,127F     ;2247            D_Q+K[.1]                ; SET THE C-BIT
U 127F, 0001,003C,0180,0988,0000,109C     ;2248            RC[1]_D                  ; SAVE PSL DATA WITH C-BIT SET
```

```
U 109C, 0000,003D,0180,0800,0000,11BE   ;2249   =0      ERLOOP                  ; THE PSL AND STATE   ARE CONFIGURED
U 109D, 0810,0038,0180,0908,0000,1280   ;2250           D_RC[1]                 . TO CATCH FAULTY SELECT LINES ON ICL
U 1280, 0000,003C,3D80,3C00,0000,1281   ;2251           ID[PSL]_D
U 1281, 0018,0038,0580,09E0,0000,1282   ;2252           RC[0C]_K[.1]            ; SAVE A OPERAND
U 1282, 0018,0038,0980,09F0,0000,1283   ;2253           RC[0E]_K[.2]            ; SAVE EXPECTED RESULT
U 1283, 0F00,003C,05F8,0800,1404,7284   ;2254           STATE_K[.1],Q_0,D_0
U 1284, 0818,0038,05C0,09D8,0000,1285   ;2255           ALU_K[.1],RC[0B]_ALU,D_ALU,Q_ALU ; SAVE B OPERAND
U 1285, 001D,0014,0180,09E8,0010,1286   ;2256           RC[0D]_ALU,ALU_D+Q,CLK.UBCC     ; SAVE GOT RESULT
U 1286, 0000,1B3C,0180,0800,0000,100E   ;2257           ALU.C?                  ; TEST INSTRUCTION
U 100E, 0000,003C,0180,0800,0000,1287   ;2258   =1110   J/ALUCAS
U 100F, 0018,0039,0580,09C8,0000,11C4   ;2259           ERROR1,RC[9]_K[.1]      ; ALU.C? FAILED (DEASSERTED)
U 1287, 0810,0038,0180,0900,0000,1288   ;2260   ALUCAS: D_RC[0]                 ; RESTORE PSL WITH C-BIT CLEAR
U 1288, 0003,003C,3D80,3DF0,0000,1289   ;2261           ID[PSL]_D,RC[0E]_0      ; SAVE EXPECTED RESULT
U 1289, 0F00,003C,19F8,0800,1404,728A   ;2262           STATE_K[ZERO],D_0,Q_0
U 128A, 0018,0038,C180,0800,0000,128B   ;2263           ALU_K[.FFFF]
U 128B, 0600,003C,03B0,0800,0000,128C   ;2264           D_D.RIGHT,Q_Q.RIGHT,SI/7 ; SET OPERANDS TO GENERATE A CARRY
U 128C, 0001,003C,0180,09E0,0000,128D   ;2265           RC[0C]_D                ; SAVE A OPERAND
U 128D, 0001,203C,0180,09D8,0000,128E   ;2266           RC[0B]_Q                ; SAVE B OPERAND
U 128E, 001D,0014,0180,09E8,0010,128F   ;2267           RC[0D]_ALU,ALU_D+Q,CLK.UBCC ; SAVE EXPECTED RESULT
U 128F, 0000,1B3C,0180,0800,0000,109E   ;2268           ALU.C?                  ; TEST INSTRUCTION
U 109E, 0003,003D,0180,09C8,0000,11C4   ;2269   =1110   ERROR1,RC[9]_0          ; ALU.C? FAILED TO BE ASSERTED
U 109F, 0000,003C,0180,0800,0000,10AC   ;2270           NOP
                                        ;2271   ;////////////////////////////////////////////////////////////////////////
                                        ;2272   ;
                                        ;2273   ;
                                        ;2274   ;
U 10AC, 0F00,003D,0180,0800,0000,101B   ;2275   =0      D_0,CALL,J/DCB          ; SET UP COUNTER WHICH INDICATES
U 10AD, 0001,003C,0180,0AC8,0000,10BC   ;2276           R[9]_D                  ; WHICH FUNCTION IS CURRENTLY
                                        ;2277                                   ; BEING TESTED
                                        ;2278   =0
U 10BC, 0000,003D,0180,0800,0000,11D4   ;2279   ALU1:   SUBTEST
U 10BD, 0F00,003C,0180,0800,0000,1290   ;2280           D_0                     ; SET UP A CONSTANT=10
U 1290, 0018,0038,C180,0800,0000,10C0   ;2281           ALU_K[.FFFF]            ; IN R[5]
U 10C0, 0500,003D,0380,0800,0000,1010   ;2282   =0      D_D.LEFT,SI/7,CALL,J/DC0
U 10C1, 0001,003C,0180,0AA8,0000,1291   ;2283           R[5]_D
U 1291, 0500,003C,0180,0800,0000,1292   ;2284           D_D.LEFT,SI/3           ; SET UP CONSTANT (32 DEC.)
U 1292, 0001,003C,0180,0AF0,0000,1293   ;2285           R[0E]_D                 ; IN R[0E]
U 1293, 0800,003C,0180,0A48,0000,10C4   ;2286           D_R[9]
                                        ;2287                                   ; GO SET UP THE LOOP ON
                                        ;2288                                   ; ERROR ADDRESS FOR THIS
                                        ;2289                                   ; FUNCTION.
U 10C4, 0003,193D,0180,0AF8,0000,10A0   ;2290   =0      R[0F]_0,CALL,D3-0?,J/LPTAB
U 10C5, 0800,003C,0180,0A28,0000,1294   ;2291   ALU2:   D_R[5]                  ; INITIALIZE THE A PATTERN COUNTER.
U 1294, 0001,003C,0180,0AB0,0000,1295   ;2292           R[6]_D
U 1295, 0003,003C,0180,0A98,0000,1296   ;2293           R[3]_0                  ; INITIALIZE THE A PATTERN.
U 1296, 0800,003C,0180,0A28,0000,1297   ;2294   ALU3:   D_R[5]                  ; INITIALIZE THE B PATTERN COUNTER.
U 1297, 0001,003C,0180,0AB8,0000,1298   ;2295           R[7]_D
U 1298, 0003,003C,0180,0AA0,0000,1299   ;2296           R[4]_0                  ; INITIALIZE THE B PATTERN.
U 1299, 0800,003C,0180,0A48,0000,10C8   ;2297   ALU4:   D_R[9]                  ; GO TO THE ROUTINE WHICH EXECUTES
U 10C8, 0000,193D,0180,0800,0000,10B0   ;2298   =0      CALL,D3-0?,J/SIMXCT     ; AND CHECKS THE FUNCTION BEING TESTED
U 10C9, 0018,0000,0580,0AB8,0010,129A   ;2299           R[7]_LA-K[.1],CLK.UBCC  ; SEE IF B COUNT IS 1.
U 129A, 0000,013C,0180,0800,0000,10CA   ;2300           Z?
U 10CA, 0000,003C,0180,0A20,0000,129B   ;2301   =0      LAB_R[4],J/ALU6         ; IF NOT GO INCREMENT B PATTERN.
U 10CB, 0000,003C,0180,0A30,0000,129C   ;2302           LAB_R[6],J/ALU7         ; OTHERWISE GO CHECK A COUNT.
U 129B, 0018,0014,0580,0AA0,0000,1299   ;2303   ALU6:   R[4]_LA+K[.1],J/ALU4    ; INCREMENT B PATTERN AND CONTINUE
```

```
                                          ;2304                                       ; TEST.
U 129C, 0018,0000,0580,0AB0,0010,129D     ;2305   ALU7:   R[6]_LA-K[.1],CLK.UBCC  ; SEE IF A COUNT IS 1.
U 129D, 0000,013C,0180,0800,0000,10CC     ;2306           Z?
U 10CC, 0000,003C,0180,0A18,0000,129E     ;2307   =0      LAB_R[3],J/ALU9         ; IF NOT THEN GO INCREMENT A PATTERN.
U 10CD, 0000,003C,0180,0A70,0000,10D0     ;2308           LAB_R[0E],J/ALU10       ; OTHERWISE GO CHECK NEXT FOUR BIT SLICE.
U 129E, 0018,0014,0580,0A98,0000,1296     ;2309   ALU9:   R[3]_LA+K[.1],J/ALU3    ; INCREMENT A PATTERN, GO INITIALIZE
                                          ;2310                                   ; B PATTERN AND B COUNT AND
                                          ;2311                                   ; CONTINUE THE TEST.
                                          ;2312   =0
                                          ;2313   ; NOW SET UP FOR TESTING HIGH ORDER FOUR BIT SLICE
                                          ;2314   ; ALU CHIPS.
U 10D0, 0F00,003D,0180,0800,0000,1018     ;2315   ALU10:  D_0,CALL,J/DC8          ; SET UP PATTERN INCREMENT.
U 10D1, 0001,003C,0180,0AA8,0000,10D2     ;2316           R[5]_D                  ; R[5]=8
U 10D2, 0F00,003D,0180,0800,0000,1017     ;2317   =0      D_0,CALL,J/DC7          ; SET UP COUNTER FOR NUMBER
U 10D3, 0001,003C,0180,0AC0,0000,129F     ;2318           R[8]_D                  ; OF BIT SLICES TO BE TESTED, 7.
U 129F, 0800,003C,0180,0A70,0000,12A0     ;2319   ALU12:  D_R[0E]                 ; SET UP A PATTERN COUNTER.
U 12A0, 0001,003C,0180,0AB0,0000,12A1     ;2320           R[6]_D                  ; R[6]=32 (DEC.)
U 12A1, 0003,003C,0180,0A98,0000,12A2     ;2321           R[3]_0                  ; SET UP A PATTERN.
U 12A2, 0800,003C,0180,0A70,0000,12A3     ;2322   ALU13:  D_R[0E]                 ; SET UP B PATTERN COUNTER.
U 12A3, 0001,003C,0180,0AB8,0000,12A4     ;2323           R[7]_D                  ; R[7]= 32(DEC).
U 12A4, 0003,003C,0180,0AA0,0000,12A5     ;2324           R[4]_0                  ; SET UP B PATTERN
U 12A5, 0800,003C,0180,0A48,0000,10D8     ;2325   ALU14:  D_R[9]                  ; GO TO THE ROUTINE THAT
U 10D8, 0000,193D,0180,0800,0000,10B0     ;2326   =0      CALL,D3-0?,J/SIMXCT     ; SIMULATES EXECUTES AND CHECKS
                                          ;2327                                   ; THE FUNCTION BEING TESTED.
U 10D9, 0018,0000,0580,0AB8,0010,12A6     ;2328           R[7]_LA-K[.1],CLK.UBCC  ; IS THE B COUNT 1?
U 12A6, 0000,013C,0180,0800,0000,10DA     ;2329           Z?
U 10DA, 0800,003C,0180,0A20,0000,12A7     ;2330   =0      D_R[4],J/ALU16          ; IF NOT GO INCREMENT THE B PATTERN.
U 10DB, 0000,003C,0180,0A30,0000,12A9     ;2331           LAB_R[6],J/ALU17        ; OTHERWISE LOOK AT A COUNT.
U 12A7, 0000,003C,0180,0A28,0000,12A8     ;2332   ALU16:  LAB_R[5]                ; INCREMENT B PATTERN BY R[5]
U 12A8, 001C,2014,0180,0AA0,0000,12A5     ;2333           R[4]_LA+D,J/ALU14       ; AND CONTINUE TEST.
U 12A9, 0018,0000,0580,0AB0,0010,12AB     ;2334   ALU17:  R[6]_LA-K[.1],CLK.UBCC  ; IS A COUNTER 1?
U 12AB, 0000,013C,0180,0800,0000,10DC     ;2335           Z?
U 10DC, 0800,003C,0180,0A18,0000,12AC     ;2336   =0      D_R[3],J/ALU19          ; IF NOT INCREMENT A PATTERN.
U 10DD, 0000,003C,0180,0A40,0000,12AE     ;2337           LAB_R[8],J/ALU20        ; OTHERWISE SEE IF ALL
                                          ;2338                                   ; BIT SLICES HAVE BEEN TESTED.
U 12AC, 0000,003C,0180,0A28,0000,12AD     ;2339   ALU19:  LAB_R[5]                ; INCREMENT A PATTERN BY R[5]
U 12AD, 001C,2014,0180,0A98,0000,12A2     ;2340           R[3]_LA+D,J/ALU13       ; AND CONTINUE TEST.
U 12AE, 0018,0000,0580,0AC0,0010,12AF     ;2341   ALU20:  R[8]_LA-K[.1],CLK.UBCC  ; SEE IF ALL 4-BIT SLICES HAVE
U 12AF, 0000,013C,0180,0800,0000,10E0     ;2342           Z?                      ; BEEN TESTED.
U 10E0, 0800,003C,0180,0A28,0000,10E2     ;2343   =0      D_R[5],J/ALU22          ; IF NOT GO TO NEXT SLICE.
U 10E1, 0000,003C,0180,0A48,0010,12B0     ;2344           ALU_R[9],CLK.UBCC       ; OTHERWISE SEE IF ALL FUNCTIONS
U 12B0, 0000,013C,0180,0800,0000,10E8     ;2345           Z?,J/ALU23              ; HAVE BEEN TESTED.
                                          ;2346   =0
U 10E2, 0000,003D,0180,0800,0000,1010     ;2347   ALU22:  CALL,J/DC0              ; IF ALL 4-BIT SLICES HAVEN'T BEEN
U 10E3, 0001,003C,0180,0AA8,0000,129F     ;2348           R[5]_D,J/ALU12          ; TESTED MOVE TO NEXT SLICE.
                                          ;2349   =0
U 10E8, 0018,0000,0580,0AC8,0000,10BC     ;2350   ALU23:  R[9]_LA-K[.1],J/ALU1    ; ALL FUNCTIONS HAVEN'T BEEN
                                          ;2351                                   ; TESTED SO DECREMENT COUNTER
                                          ;2352                                   ; AND RESTART TEST.
U 10E9, 0000,003C,0180,0800,0000,133E     ;2353   ALU24:  J/ALU100                ; DONE!
                                          ;2354   ; THIS TABLE IS USED TO INDEX TO THE ROUTINES WHICH SET UP
                                          ;2355   ; THE LOOP ON ERROR ADDRESSES FOR EACH FUNCTION:
                                          ;2356   =0000
U 10A0, 0000,003C,0180,0800,0000,11AA     ;2357   LPTAB:  J/LPERF12
U 10A1, 0000,003C,0180,0800,0000,115A     ;2358           J/LPERF11
```

```
U 10A2, 0000,003C,0180,0800,0000,1150    ;2359           J/LPERF10
U 10A3, 0000,003C,0180,0800,0000,1130    ;2360           J/LPERF9
U 10A4, 0000,003C,0180,0800,0000,112A    ;2361           J/LPERF8
U 10A5, 0000,003C,0180,0800,0000,1122    ;2362           J/LPERF7
U 10A6, 0000,003C,0180,0800,0000,111C    ;2363           J/LPERF6
U 10A7, 0000,003C,0180,0800,0000,1112    ;2364           J/LPERF5
U 10A8, 0000,003C,0180,0800,0000,10FC    ;2365           J/LPERF4
U 10A9, 0000,003C,0180,0800,0000,10F8    ;2366           J/LPERF3
U 10AA, 0000,003C,0180,0800,0000,10F0    ;2367           J/LPERF2
U 10AB, 0000,003C,0180,0800,0000,10EA    ;2368           J/LPERF1
                                         ;2369   =
                                         ;2370   ; THIS TABLE IS USED TO INDEX TO THE ROUTINES USED TO
                                         ;2371   ; SIMULATE THE FUNCTION, THEN EXECUTE IT AND CHECK THE RESULT:
                                         ;2372   =0000
U 10B0, 0800,003C,0180,0A18,0000,1328    ;2373   SIMXCT: D_R[3],J/SIM12
U 10B1, 0800,003C,0180,0A18,0000,131C    ;2374           D_R[3],J/SIM11
U 10B2, 0800,003C,0180,0A18,0000,1310    ;2375           D_R[3],J/SIM10
U 10B3, 0800,003C,0180,0A18,0000,1304    ;2376           D_R[3],J/SIM9
U 10B4, 0800,003C,0180,0A18,0000,12F5    ;2377           D_R[3],J/SIM8
U 10B5, 0800,003C,0180,0A18,0000,12EC    ;2378           D_R[3],J/SIM7
U 10B6, 0800,003C,0180,0A18,0000,12E3    ;2379           D_R[3],J/SIM6
U 10B7, 0800,003C,0180,0A70,0000,12D6    ;2380           D_R[0E],J/SIM5
U 10B8, 0800,003C,0180,0A70,0000,12C9    ;2381           D_R[0E],J/SIM4
U 10B9, 0800,003C,0180,0A18,0000,12C0    ;2382           D_R[3],J/SIM3
U 10BA, 0800,003C,0180,0A18,0000,12B9    ;2383           D_R[3],J/SIM2
U 10BB, 0800,003C,0180,0A18,0000,12B2    ;2384           D_R[3],J/SIM1
                                         ;2385   =
                                         ;2386   ;//////////////////////////////////////////////////////////////
                                         ;2387   ;+
                                         ;2388   ; SUBTEST       2
                                         ;2389   ; ROUTINE TO SIMULATE, EXECUTE AND CHECK THE ALU/A FUNCTION.
                                         ;2390   ;-
                                         ;2391   =0
U 10EA, 0000,003D,0180,0800,0000,11BE    ;2392   LPERF1: ERLOOP
U 10EB, 0800,003C,0180,0A78,0000,12B1    ;2393           D_R[0F]                 ; WAS THIS CALL TO SET THE
U 12B1, 0000,0D3C,0180,0800,0000,1005    ;2394           SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 1005, 0018,003A,C180,0AF8,0000,0001    ;2395   =101    R[0F]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY OCCUR
                                         ;2396                                   ; WITH THE LOOP ON ERROR OPTION
                                         ;2397                                   ; SPECIFIED BY THE USER.
U 1007, 0800,003C,0180,0A18,0000,12B2    ;2398           D_R[3]                  ; SET UP THE OPERANDS AND
U 12B2, 0000,003C,01C0,0A20,0000,12B3    ;2399   SIM1:   Q_R[4]                  ; SAVE THE EXPECTED RESULT.
U 12B3, 0001,003C,0180,0A88,0000,12B4    ;2400           R[1]_D
U 12B4, 001D,003C,01C0,0A90,0000,12B5    ;2401   XCT1.   ALU_D[A]Q,Q_ALU,R[2]_ALU ; TEST INSTRUCTION
U 12B5, 0800,003C,0180,0A08,0000,12B6    ;2402           D_R[1]
U 12B6, 001D,2000,0180,0800,0010,12B7    ;2403   XCT1B:  ALU_Q-D,CLK.UBCC        ; CHECK THE RESULT.
U 12B7, 0000,013C,0180,0800,0000,10EC    ;2404           Z?
U 10EC, 0000,003C,0180,0800,0000,11C2    ;2405   =0      J/ALUER2                ; RESULT INCORRECT.
U 10ED, 0000,003E,0180,0A38,0000,0001    ;2406           LAB_R[7],RETURN1
                                         ;2407   ;//////////////////////////////////////////////////////////////
                                         ;2408   ;+
                                         ;2409   ; SUBTEST       3
                                         ;2410   ; SIMULATE EXECUTE AND CHECK THE ALU/B FUNCTION
                                         ;2411   ;-
                                         ;2412   =0
U 10F0, 0000,003D,0180,0800,0000,11BE    ;2413   LPERF2: ERLOOP
```

```
U 10F1, 0800,003C,0180,0A78,0000,12B8             D_R[0F]                 ; WAS THIS CALL TO SET THE
U 12B8, 0000,0D3C,0180,0800,0000,1045             SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 1045, 0018,003A,C180,0AF8,0000,0001     =101    R[0F]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY OCCUR
                                                                          ; WITH THE LOOP ON ERROR OPTION
                                                                          ; SPECIFIED BY THE USER.
U 1047, 0800,003C,0180,0A18,0000,12B9             D_R[3]                  ; SET UP THE OPERANDS
U 12B9, 0000,003C,01C0,0A20,0000,12BA     SIM2:   Q_R[4]                  ; AND SAVE THE EXPECTED RESULT.
U 12BA, 0001,203C,0180,0A88,0000,12BB             R[1]_Q
U 12BB, 001D,0038,01C0,0A90,0000,12BC     XCT2:   ALU_D[B]Q,Q_ALU,R[2]_ALU ; TEST INSTRUCTION
U 12BC, 0800,003C,0180,0A08,0000,12BD             D_R[1]
U 12BD, 001D,2000,0180,0800,0010,12BE     XCT2B:  ALU_Q-D,CLK.UBCC        ; WAS THE RESULT CORRECT?
U 12BE, 0000,013C,0180,0800,0000,10F2             Z?
U 10F2, 0000,003C,0180,0800,0000,11C2     =0      J/ALUER2                ; RESULT INCORRECT REPORT ERROR.
U 10F3, 0000,003E,0180,0A38,0000,0001             LAB_R[7],RETURN1
                                          ;//////////////////////////////////////////////////////////////
                                          ;+
                                          ; SUBTEST      4
                                          ; SIMULATE , EXECUTE AND CHECK THE RESULT OF THE ALU/NOTA FUNCTION
                                          ;-
                                          =0
U 10F8, 0000,003D,0180,0800,0000,11BE     LPERF3: ERLOOP
U 10F9, 0800,003C,0180,0A78,0000,12BF             D_R[0F]                 ; WAS THIS CALL TO SET THE
U 12BF, 0000,0D3C,0180,0800,0000,104D             SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 104D, 0018,003A,C180,0AF8,0000,0001     =101    R[0F]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY OCCUR
                                                                          ; WITH THE LOOP ON ERROR OPTION
                                                                          ; SPECIFIED BY THE USER.
U 104F, 0800,003C,0180,0A18,0000,12C0             D_R[3]                  ; SET UP THE OPERANDS.
U 12C0, 0000,003C,01F8,0800,0000,12C1     SIM3:   Q_0                     ; CALCULATE THE EXPECTED
U 12C1, 0019,2000,05C0,0800,0000,12C2             Q_Q-K[.1]               ; RESULT.
U 12C2, 001D,2000,0180,0A88,0000,12C3             ALU_Q-D,R[1]_Q-D        ; NOT.A=-1-A
U 12C3, 0000,003C,01C0,0A20,0000,12C4     XCT3:   Q_R[4]
U 12C4, 001D,0028,01C0,0A90,0000,12C5             ALU_D[NOTA]Q,Q_ALU,R[2]_ALU ; TEST INSTRUCTION.
U 12C5, 0800,003C,0180,0A08,0000,12C6             D_R[1]
U 12C6, 001D,2000,0180,0800,0010,12C7     XCT3B:  ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12C7, 0000,013C,0180,0800,0000,10FA             Z?
U 10FA, 0000,003C,0180,0800,0000,11C2     =0      J/ALUER2                ; RESULT INCORRECT.
U 10FB, 0000,003E,0180,0A38,0000,0001             LAB_R[7],RETURN1
                                          ;//////////////////////////////////////////////////////////////
                                          ;+
                                          ; SUBTEST      5
                                          ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/OR FUNCTION
                                          ;-
                                          =0
U 10FC, 0000,003D,0180,0800,0000,11BE     LPERF4: ERLOOP
U 10FD, 0800,003C,0180,0A78,0000,12C8             D_R[0F]                 ; WAS THIS CALL TO SET THE
U 12C8, 0000,0D3C,0180,0800,0000,1055             SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 1055, 0018,003A,C180,0AF8,0000,0001     =101    R[0F]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY OCCUR
                                                                          ; WITH THE LOOP ON ERROR OPTION
                                                                          ; SPECIFIED BY THE USER.
U 1057, 0800,003C,0180,0A70,0000,12C9             D_R[0E]                 ; SET UP THE OPERANDS.
U 12C9, 0001,003C,0180,0AE8,0000,12CA     SIM4:   R[0D]_D                 ; AND CALCULATE THE
U 12CA, 0800,003C,0180,0A18,0000,12CB             D_R[3]                  ; EXPECTED RESULT.
U 12CB, 0000,003C,01C0,0A20,0000,12CC             Q_R[4]
U 12CC, 0000,0D3C,0180,0800,0000,1092             SIGNS?
                                          =010
```

```
U 1092, 0500,003C,01A8,0A68,0000,12CD    ;2469   SIM4A:  Q_Q.LEFT,SI/ZERO,D_D.LEFT,LAB_R[0D],J/SIM4B
U 1093, 0500,003C,03A8,0A68,0000,12CD    ;2470           Q_Q.LEFT,SI/7,D_D.LEFT,LAB_R[0D],J/SIM4B
U 1096, 0500,003C,03A8,0A68,0000,12CD    ;2471           Q_Q.LEFT,SI/7,D_D.LEFT,LAB_R[0D],J/SIM4B
U 1097, 0500,003C,03A8,0A68,0000,12CD    ;2472           Q_Q.LEFT,SI/7,D_D.LEFT,LAB_R[0D],J/SIM4B
U 12CD, 0018,0000,0580,0AE8,0010,12CE    ;2473   SIM4B:  R[0D]_LA-K[.1],CLK.UBCC
U 12CE, 0000,013C,0180,0800,0000,110A    ;2474           Z?
U 110A, 0000,0D3C,0180,0800,0000,1092    ;2475   =0      SIGNS?,J/SIM4A
U 110B, 0001,203C,0180,0A88,0000,12CF    ;2476           R[1]_Q                  ; SAVE THE EXPECTED RESULT.
U 12CF, 0800,003C,0180,0A18,0000,12D0    ;2477   XCT4:   D_R[3]                  ; SET UP THE OPERANDS.
U 12D0, 0000,003C,01C0,0A20,0000,12D1    ;2478           Q_R[4]
U 12D1, 001D,0030,01C0,0A90,0000,12D2    ;2479           A[U_D[OR]Q,Q_ALU,R[2]_ALU ; TEST INSTRUCTION
U 12D2, 0800,003C,0180,0A08,0000,12D3    ;2480           D_R[1]
U 12D3, 001D,2000,0180,0800,0010,12D4    ;2481   XCT4B:  A[U_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12D4, 0000,013C,0180,0800,0000,1110    ;2482           Z?
U 1110, 0000,003C,0180,0800,0000,11C2    ;2483   =0      J/ALUER2                ; RESULT INCORRECT.
U 1111, 0000,003E,0180,0A38,0000,0001    ;2484           LAB_R[7],RETURN1
                                         ;2485   ;////////////////////////////////////////////////////////////
                                         ;2486   ;+
                                         ;2487   ; SUBTEST       6
                                         ;2488   ; SIMUALTE EXECUTE AND CHECK THE RESULT OF THE ALU/AND FUNCTION
                                         ;2489   ;-
                                         ;2490   =0
U 1112, 0000,003D,0180,0800,0000,11BE    ;2491   LPERF5: ERLOOP
U 1113, 0800,003C,0180,0A78,0000,12D5    ;2492           D_R[0F]                 ; WAS THIS CALL TO SET THE
U 12D5, 0000,0D3C,0180,0800,0000,105D    ;2493           SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 105D, 0018,003A,C180,0AF8,0000,0001    ;2494   =101    R[0F]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY OCCUR
                                         ;2495                                   ; WITH THE LOOP ON ERROR OPTION
                                         ;2496                                   ; SPECIFIED BY THE USER.
U 105F, 0800,003C,0180,0A70,0000,12D6    ;2497           D_R[0E]                 ; SET UP THE OPERANDS.
U 12D6, 0001,003C,0180,0AE8,0000,12D7    ;2498   SIM5:   R[0D]_D                 ; AND GET READY TO
U 12D7, 0800,003C,0180,0A18,0000,12D8    ;2499           D_R[3]                  ; CALCULATE THE EXPECTED
U 12D8, 0000,003C,01C0,0A20,0000,12D9    ;2500           Q_R[4]                  ; RESULT.
U 12D9, 0000,0D3C,0180,0800,0000,10C2    ;2501           SIGNS?
                                         ;2502   =010
U 10C2, 0500,003C,01A8,0A68,0000,12DA    ;2503   SIM5A:  Q_Q.LEFT,SI/ZERO,D_D.LEFT,LAB_R[0D],J/SIM5B
U 10C3, 0500,003C,01A8,0A68,0000,12DA    ;2504           Q_Q.LEFT,SI/ZERO,D_D.LEFT,LAB_R[0D],J/SIM5B
U 10C6, 0500,003C,01A8,0A68,0000,12DA    ;2505           Q_Q.LEFT,SI/ZERO,D_D.LEFT,LAB_R[0D],J/SIM5B
U 10C7, 0500,003C,03A8,0A68,0000,12DA    ;2506           Q_Q.LEFT,SI/7,D_D.LEFT,LAB_R[0D],J/SIM5B
U 12DA, 0018,0000,0580,0AE8,0010,12DB    ;2507   SIM5B:  R[0D]_LA-K[.1],CLK.UBCC
U 12DB, 0000,013C,0180,0800,0000,1118    ;2508           Z?
U 1118, 0000,0D3C,0180,0800,0000,10C2    ;2509   =0      SIGNS?,J/SIM5A
U 1119, 0001,203C,0180,0A88,0000,12DC    ;2510           R[1]_Q                  ; SAVE THE EXPECTED RESULT.
U 12DC, 0800,003C,0180,0A18,0000,12DD    ;2511   XCT5:   D_R[3]                  ; SET UP THE OPERANDS.
U 12DD, 0000,003C,01C0,0A20,0000,12DE    ;2512           Q_R[4]
U 12DE, 001D,0034,01C0,0A90,0000,12DF    ;2513           A[U_D[AND]Q,Q_ALU,R[2]_ALU ; TEST INSTRUCTION.
U 12DF, 0800,003C,0180,0A08,0000,12E0    ;2514           D_R[1]
U 12E0, 001D,2000,0180,0800,0010,12E1    ;2515   XCT5B:  A[U_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12E1, 0000,013C,0180,0800,0000,111A    ;2516           Z?
U 111A, 0000,003C,0180,0800,0000,11C2    ;2517   =0      J/ALUER2                ; RESULT INCORRECT.
U 111B, 0000,003E,0180,0A38,0000,0001    ;2518           LAB_R[7],RETURN1
                                         ;2519   ;////////////////////////////////////////////////////////////
                                         ;2520   ;+
                                         ;2521   ; SUBTEST       7
                                         ;2522   ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/ORNOT FUNCTION.
                                         ;2523   ;-
```

```
                                             ;2524   =0
U 111C, 0000,003D,0180,0800,0000,11BE        ;2525   LPERF6: ERLOOP
U 111D, 0800,003C,0180,0A78,0000,12E2        ;2526           D_R[OF]                 ; WAS THIS CALL TO SET THE
U 12E2, 0000,0D3C,0180,0800,0000,10D5        ;2527           SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 10D5, 0018,003A,C180,0AF8,0000,0001        ;2528   =101    R[OF]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY OCCUR
                                             ;2529                                   ; WITH THE LOOP ON ERROR OPTION
                                             ;2530                                   ; SPECIFIED BY THE USER.
U 10D7, 0800,003C,0180,0A18,0000,12E3        ;2531           D_R[3]                  ; SET UP THE OPREANDS.
U 12E3, 0000,003C,01C0,0A20,0000,12E4        ;2532   SIM6:   Q_R[4]                  ; AND USE THE ALREADY
U 12E4, 0001,2028,01C0,0800,0000,12E5        ;2533           Q_NOT.Q                 ; VARIFIED FUNCTIONS
U 12E5, 001D,0030,0180,0A88,0000,12E6        ;2534           R[1]_D.OR.Q             ; TO CALCULATE THE EXPECTED
                                             ;2535                                   ; RESULT.
U 12E6, 0000,003C,01C0,0A20,0000,12E7        ;2536   XCT6:   Q_R[4]                  ; SET UP THE OPERANDS.
U 12E7, 001D,001C,01C0,0A90,0000,12E8        ;2537           A[U_D[ORNOT]Q,Q_ALU,R[2]_ALU ; TEST INSTRUCTION
U 12E8, 0800,003C,0180,0A08,0000,12E9        ;2538           D_R[1]
U 12E9, 001D,2000,0180,0800,0010,12EA        ;2539   XCT6B:  A[U_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12EA, 0000,013C,0180,0800,0000,1120        ;2540           Z?
U 1120, 0000,003C,0180,0800,0000,11C2        ;2541   =0      J/ALUER2                ; INCORRECT.
U 1121, 0000,003E,0180,0A38,0000,0001        ;2542           LAB_R[7],RETURN1
                                             ;2543   ;///////////////////////////////////////////////////////////////
                                             ;2544   ;+
                                             ;2545   ; SUBTEST       8
                                             ;2546   ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/ANDNOT FUNCTION
                                             ;2547   ;-
                                             ;2548   =0
U 1122, 0000,003D,0180,0800,0000,11BE        ;2549   LPERF7: ERLOOP
U 1123, 0800,003C,0180,0A78,0000,12EB        ;2550           D_R[OF]                 ; WAS THIS CALL TO SET THE
U 12EB, 0000,0D3C,0180,0800,0000,10E5        ;2551           SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 10E5, 0018,003A,C180,0AF8,0000,0001        ;2552   =101    R[OF]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY OCCUR
                                             ;2553                                   ; WITH THE LOOP ON ERROR OPTION
                                             ;2554                                   ; SPECIFIED BY THE USER.
U 10E7, 0800,003C,0180,0A18,0000,12EC        ;2555           D_R[3]                  ; SET UP THE OPERANDS.
U 12EC, 0000,003C,01C0,0A20,0000,12ED        ;2556   SIM7:   Q_R[4]
U 12ED, 0001,2028,01C0,0800,0000,12EE        ;2557           Q_NOT.Q                 ; CALCULATE THE EXPECETED
U 12EE, 001D,0034,0180,0A88,0000,12EF        ;2558           R[1]_D.AND.Q            ; RESULT.
U 12EF, 0000,003C,01C0,0A20,0000,12F0        ;2559   XCT7:   Q_R[4]                  ; SET UP THE OPERANDS.
U 12F0, 001D,0024,01C0,0A90,0000,12F1        ;2560           A[U_D[ANDNOT]Q,Q_ALU,R[2]_ALU ; TEST INSTRUCTION.
U 12F1, 0800,003C,0180,0A08,0000,12F2        ;2561           D_R[1]
U 12F2, 001D,2000,0180,0800,0010,12F3        ;2562   XCT7B:  A[U_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12F3, 0000,013C,0180,0800,0000,1128        ;2563           Z?
U 1128, 0000,003C,0180,0800,0000,11C2        ;2564   =0      J/ALUER2                ; INCORRECT
U 1129, 0000,003E,0180,0A38,0000,0001        ;2565           LAB_R[7],RETURN1
                                             ;2566   ;///////////////////////////////////////////////////////////////
                                             ;2567   ;+
                                             ;2568   ; SUBTEST       9
                                             ;2569   ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/XOR FUNCTION.
                                             ;2570   ; NOTE: A.XOR.B= (A.ANDNOT.B).OR.(B.ANDNOT.A)
                                             ;2571   ;-
                                             ;2572   =0
U 112A, 0000,003D,0180,0800,0000,11BE        ;2573   LPERF8: ERLOOP
U 112B, 0800,003C,0180,0A78,0000,12F4        ;2574           D_R[OF]                 ; WAS THIS CALL TO SET THE
U 12F4, 0000,0D3C,0180,0800,0000,10F5        ;2575           SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 10F5, 0018,003A,C180,0AF8,0000,0001        ;2576   =101    R[OF]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY OCCUR
                                             ;2577                                   ; WITH THE LOOP ON ERROR OPTION
                                             ;2578                                   ; SPECIFIED BY THE USER.
```

```
U 10F7, 0800,003C,0180,0A18,0000,12F5   ;2579           D_R[3]                  ; SET UP THE OPERANDS.
U 12F5, 0000,003C,01C0,0A20,0000,12F6   ;2580   SIM8:   Q_R[4]
U 12F6, 001D,0024,0180,0AD0,0000,12F7   ;2581           A[U_D[ANDNOT]Q,R[0A]_ALU ; CALCULATE THE EXPECTED RESULT.
U 12F7, 0800,003C,0180,0A18,0000,12F8   ;2582           D_R[3]
U 12F8, 0000,003C,01C0,0A20,0000,12F9   ;2583           Q_R[4]
U 12F9, 001D,2024,0180,0AD8,0000,12FA   ;2584           A[U_Q[ANDNOT]D,R[0B]_ALU
U 12FA, 0800,003C,0180,0A50,0000,12FB   ;2585           D_R[0A]
U 12FB, 0000,003C,01C0,0A58,0000,12FC   ;2586           Q_R[0B]
U 12FC, 001D,0030,0180,0A88,0000,12FD   ;2587           R[1]_D.OR.Q
U 12FD, 0800,003C,0180,0A18,0000,12FE   ;2588   XCT8:   D_R[3]                  ; SET UP THE OPERANDS.
U 12FE, 0000,003C,01C0,0A20,0000,12FF   ;2589           Q_R[4]
U 12FF, 001D,0020,01C0,0A90,0000,1300   ;2590           A[U_D[XOR]Q,Q_ALU,R[2]_ALU ; TEST INSTRUCTION.
U 1300, 0800,003C,0180,0A08,0000,1301   ;2591           D_R[1]
U 1301, 001D,2000,0180,0800,0010,1302   ;2592   XCT8B:  A[U_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1302, 0000,013C,0180,0800,0000,112C   ;2593           Z?
U 112C, 0000,003C,0180,0800,0000,11C2   ;2594   =0      J/ALUER2                ; RESULT INCORRECT!
U 112D, 0000,003E,0180,0A38,0000,0001   ;2595           LAB_R[7],RETURN1
                                        ;2596   ;//////////7/////////////////////////////////////////////////
                                        ;2597   ;+
                                        ;2598   ; SUBTEST       A
                                        ;2599   ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/A-B-1 FUNCTION.
                                        ;2600   ;-
                                        ;2601   =0
U 1130, 0000,003D,0180,0800,0000,11BE   ;2602   LPERF9: ERLOOP
U 1131, 0800,003C,0180,0A78,0000,1303   ;2603           D_R[0F]                 ; WAS THIS CALL TO SET THE
U 1303, 0000,0D3C,0180,0800,0000,1115   ;2604           SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 1115, 0018,003A,C180,0AF8,0000,0001   ;2605   =101    R[0F]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY OCCUR
                                        ;2606                                   ; WITH THE LOOP ON ERROR OPTION
                                        ;2607                                   ; SPECIFIED BY THE USER.
U 1117, 0800,003C,0180,0A18,0000,1304   ;2608           D_R[3]                  ; SET UP THE OPERANDS.
U 1304, 0000,003C,01C0,0A20,0000,1305   ;2609   SIM9:   Q_R[4]
U 1305, 0001,2028,01C0,0800,0000,1306   ;2610           Q_NOT.Q                 ; CALCULATE THE EXPECTED
U 1306, 001D,0014,0180,0A88,0010,1307   ;2611           R[1]_D+Q,CLK.UBCC       ; RESULT. A-B-1=A+(NOT.B)
U 1307, 0000,1B3C,0180,0800,0000,10AE   ;2612           ALU.C?                  ; NOTE THAT EVEN ALU
U 10AE, 0003,003C,0180,0AD0,0000,1308   ;2613   =1110   R[0A]_0,J/XCT9          ; CARRY 31 IS SIMULATED
U 10AF, 0018,0038,C180,0AD0,0000,1308   ;2614           R[0A]_K[.FFFF],J/XCT9   ; HERE AND TESTED DURING
                                        ;2615                                   ; THE ACTUAL FUNCTION A-B-1.
U 1308, 0000,003C,01C0,0A20,0000,1309   ;2616   XCT9:   Q_R[4]                  ; SET UP THE OPERANDS.
U 1309, 001D,0008,01C0,0A90,0010,130A   ;2617           A[U_D[A-B-1]Q,Q_ALU,R[2]_ALU,CLK.UBCC ; TEST INSTRUCTION.
U 130A, 0000,1B3C,0180,0800,0000,10BE   ;2618           ALU.C?                  ; TEST ALU CARRY 31.
U 10BE, 0000,003C,0180,0A50,0010,130C   ;2619   =1110   ALU_R[0A],CLK.UBCC,J/XCT9C
U 10BF, 0000,003C,0180,0A50,0010,130B   ;2620           ALU_R[0A],CLK.UBCC
U 130B, 0000,013C,0180,0800,0000,1132   ;2621           Z?
U 1132, 0000,003C,0180,0800,0000,1139   ;2622   =0      J/XCT9D
U 1133, 0000,003C,0180,0800,0000,11C0   ;2623           J/ALUER0                ; ALU CARRY 31 WASN'T 0
U 130C, 0000,013C,0180,0800,0000,1138   ;2624   XCT9C:  Z?
U 1138, 0000,003C,0180,0800,0000,11BA   ;2625   =0      J/ALUER1                ; ALU CARRY 31 WASN'T 1
U 1139, 0800,003C,0180,0A08,0000,130D   ;2626   XCT9D:  D_R[1]
U 130D, 001D,2000,0180,0800,0010,130E   ;2627           A[U_Q-D,CLK.UBCC        ; CHECK THE RESULT.
U 130E, 0000,013C,0180,0800,0000,113A   ;2628           Z?
U 113A, 0000,003C,0180,0800,0000,11C2   ;2629   =0      J/ALUER2                ; RESULT INCORRECT!
U 113B, 0000,003E,0180,0A38,0000,0001   ;2630           LAB_R[7],RETURN1
                                        ;2631   ;//////////7/////////////////////////////////////////////////
                                        ;2632   ;+
                                        ;2633   ; SUBTEST       B
                                        ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/A+B+1 FUNCTION
                                        ;-
                                        =0
U 1150, 0000,003D,0180,0800,0000,11BE   LPERF10:        ERLOOP
U 1151, 0800,003C,0180,0A78,0000,130F           D_R[OF]                 ; WAS THIS CALL TO SET THE
U 130F, 0000,0D3C,0180,0800,0000,1125           SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 1125, 0018,003A,C180,0AF8,0000,0001   =101    R[OF]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY OCCUR
                                                                        ; WITH THE LOOP ON ERROR OPTION
                                                                        ; SPECIFIED BY THE USER.
U 1127, 0800,003C,0180,0A18,0000,1310           D_R[3]                  ; SET UP THE OPERANDS
U 1310, 0000,003C,01C0,0A20,0000,1311   SIM10:  Q_R[4]
U 1311, 0001,2028,01C0,0800,0000,1312           Q_NOT.Q                 ; CALCULATE THE EXPECTED
U 1312, 001D,0000,0180,0A88,0010,1313           R[1]_D-Q,CLK.UBCC       ; RESULT. A+B+1=A-(NOT.B)=B-(NOT.A)
U 1313, 0000,1B3C,0180,0800,0000,10CE           ALU.C?                  ; NOTE THAT ALU CARRY 31
U 10CE, 0003,003C,0180,0AD0,0000,1314   =1110   R[OA]_0,J/XCT10         ; IS ALSO TESTED HERE.
U 10CF, 0018,0038,C180,0AD0,0000,1314           R[OA]_K[.FFFF],J/XCT10
U 1314, 0000,003C,01C0,0A20,0000,1315   XCT10:  Q_R[4]                  ; SET UP THE OPERANDS.
U 1315, 001D,0010,01C0,0A90,0010,1316           A[U_D[A+B+1]Q,Q_ALU,R[2]_ALU,CLK.UBCC ; TEST INSTRUCTION
U 1316, 0000,1B3C,0180,0800,0000,10DE           ALU.C?                  ; TEST THE CARRY FUNCTION.
U 10DE, 0000,003C,0180,0A50,0010,1318   =1110   ALU_R[OA],CLK.UBCC,J/XCT10C
U 10DF, 0000,003C,0180,0A50,0010,1317           ALU_R[OA],CLK.UBCC
U 1317, 0000,013C,0180,0800,0000,1152           Z?
U 1152, 0000,003C,0180,0800,0000,1157   =0      J/XCT10D
U 1153, 0000,003C,0180,0800,0000,11C0           J/ALUER0                ; ALU CARRY 31 WASN'T 0
U 1318, 0000,013C,0180,0800,0000,1156   XCT10C: Z?
U 1156, 0000,003C,0180,0800,0000,11BA   =0      J/ALUER1                ; ALU CARRY 31 WASN'T 1
U 1157, 0800,003C,0180,0A08,0000,1319   XCT10D: D_R[1]
U 1319, 001D,2000,0180,0800,0010,131A           A[U_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 131A, 0000,013C,0180,0800,0000,1158           Z?
U 1158, 0000,003C,0180,0800,0000,11C2   =0      J/ALUER2                ; INCORRECT RESULT!
U 1159, 0000,003E,0180,0A38,0000,0001           LAB_R[7],RETURN1
                                        ;///////7///////////////////////////////////////////////////
                                        ;+
                                        ; SUBTEST       C
                                        ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/A-B(RLOG) FUNCTION
                                        ;-
                                        =0
U 115A, 0000,003D,0180,0800,0000,11BE   LPERF11:        ERLOOP
U 115B, 0800,003C,0180,0A78,0000,131B           D_R[OF]                 ; WAS THIS CALL TO SET THE
U 131B, 0000,0D3C,0180,0800,0000,1135           SIGNS?                  ; THE LOOP ON ERROR ADDRESS
U 1135, 0018,003A,C180,0AF8,0000,0001   =101    R[OF]_K[.FFFF],RETURN1  ; OR DID AN ERROR ACTUALLY OCCUR
                                                                        ; WITH THE LOOP ON ERROR OPTION
                                                                        ; SPECIFIED BY THE USER.
U 1137, 0800,003C,0180,0A18,00C0,131C           D_R[3]
U 131C, 0000,003C,01C0,0A20,0000,131D   SIM11:  Q_R[4]                  ; SET UP THE OPERANDS.
U 131D, 0001,2028,01C0,0800,0000,131E           Q_NOT.Q                 ; AND CALCULATE THE EXPECTED
U 131E, 001D,2010,0180,0A88,0010,131F           A[U_Q[A+B+1]D,R[1]_ALU,CLK.UBCC ; RESULT.
U 131F, 0000,1B3C,0180,0800,0000,10EE           ALU.C?                  ; INCLUDING THE AFFECT ON
U 10EE, 0003,003C,0180,0AD0,0000,1320   =1110   R[OA]_0,J/XCT11         ; ALU CARRY 31.
U 10EF, 0018,0038,C180,0AD0,0000,1320           R[OA]_K[.FFFF],J/XCT11
U 1320, 0000,003C,01C0,0A20,0000,1321   XCT11:  Q_R[4]                  ; SET UP THE OPERANDS.
U 1321, 001D,0004,01C0,0A90,0010,1322           A[U_D[A-B.RLOG]Q,Q_ALU,R[2]_ALU,CLK.UBCC ; TEST INSTRUCTION.
U 1322, 0000,1B3C,0180,0800,0000,10FE           ALU.C?                  ; CHECK CARRY BIT.
U 10FE, 0000,003C,0180,0A50,0010,1324   =1110   ALU_R[OA],CLK.UBCC,J/XCT11C
U 10FF, 0000,003C,0180,0A50,0010,1323           ALU_R[OA],CLK.UBCC
```

```
U 1323, 0000,013C,0180,0800,0000,1198   ;2689           Z?
U 1198, 0000,003C,0180,0800,0000,119B   ;2690   =0      J/XCT11D
U 1199, 0000,003C,0180,0800,0000,11C0   ;2691           J/ALUER0               ; ALU CARRY 31 WASN'T 0
U 1324, 0000,013C,0180,0800,0000,119A   ;2692   XCT11C: Z?
U 119A, 0000,003C,0180,0800,0000,11BA   ;2693   =0      J/ALUER1               ; ALU CARRY 31 WASN'T 1
U 119B, 0800,003C,0180,0A08,0000,1325   ;2694   XCT11D: D_R[1]
U 1325, 001D,2000,0180,0800,0010,1326   ;2695           A[U_Q-D,CLK.UBCC       ; CHECK THE RESULT.
U 1326, 0000,013C,0180,0800,0000,11A8   ;2696           Z?
U 11A8, 0000,003C,0180,0800,0000,11C2   ;2697   =0      J/ALUER2               ; RESULT INCORRECT!
U 11A9, 0000,003E,0180,0A38,0000,0001   ;2698           LAB_R[7],RETURN1
                                        ;2699   ;///////////7///////////////////////////////////////////////
                                        ;2700   ;+
                                        ;2701   ; SUBTEST       D
                                        ;2702   ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE ALU/A-B(RLOG) FUNCTION.
                                        ;2703   ;-
                                        ;2704   =0
U 11AA, 0000,003D,0180,0800,0000,11BE   ;2705   LPERF12:        ERLOOP
U 11AB, 0800,003C,0180,0A78,0000,1327   ;2706           D_R[0F]                ; WAS THIS CALL TO SET THE
U 1327, 0000,0D3C,0180,0800,0000,115D   ;2707           SIGNS?                 ; THE LOOP ON ERROR ADDRESS
U 115D, 0018,003A,C180,0AF8,0000,0001   ;2708   =101    R[0F]_K[.FFFF],RETURN1 ; OR DID AN ERROR ACTUALLY OCCUR
                                        ;2709                                  ; WITH THE LOOP ON ERROR OPTION
                                        ;2710                                  ; SPECIFIED BY THE USER.
U 115F, 0800,003C,0180,0A18,0000,1328   ;2711           D_R[3]                 ; SET UP THE OPERANDS.
J 1328, 0000,003C,01C0,0A20,0000,1329   ;2712   SIM12:  Q_R[4]
U 1329, 0801,0028,0180,0800,0000,132A   ;2713           D_NOT.D                ; CALCULATE THE EXPECTED
U 132A, 001D,2008,0180,0A88,0010,132B   ;2714           A[U_Q[A-B-1]D,R[1]_ALU,CLK.UBCC ; RESULT.
U 132B, 0000,1B3C,0180,0800,0000,111E   ;2715           ALU.C?                 ; INCLUDING THE EXPECTED
U 111E, 0003,003C,0180,0AD0,0000,132C   ;2716   =1110   R[0A]_0,J/XCT12        ; ALU CARRY 31.
U 111F, 0018,0038,C180,0AD0,0000,132C   ;2717           R[0A]_K[.FFFF]
U 132C, 0800,003C,0180,0A18,0000,132D   ;2718   XCT12:  D_R[3]                 ; SET UP THE OPERANDS.
U 132D, 001D,0018,01C0,0A90,0010,132E   ;2719           A[U_D[A+B.RLOG]Q,Q_ALU,R[2]_ALU,CLK.UBCC ; TEST INSTRUCTION
U 132E, 0000,1B3C,0180,0800,0000,112E   ;2720           ALU.C?                 ; CHECK ALU CARRY 31.
U 112E, 0000,003C,0180,0A50,0010,1330   ;2721   =1110   ALU_R[0A],CLK.UBCC,J/XCT12C
U 112F, 0000,003C,0180,0A50,0010,132F   ;2722           ALU_R[0A],CLK.UBCC
U 132F, 0000,013C,0180,0800,0000,11B0   ;2723           Z?
U 11B0, 0000,003C,0180,0800,0000,11B3   ;2724   =0      J/XCT12D
U 11B1, 0000,003C,0180,0800,0000,11C0   ;2725           J/ALUER0               ; ALU CARRY 31 WASN'T 0
U 1330, 0000,013C,0180,0800,0000,11B2   ;2726   XCT12C: Z?
U 11B2, 0000,003C,0180,0800,0000,11BA   ;2727   =0      J/ALUER1               ; ALU CARRY 31 WASN'T 1
U 11B3, 0800,003C,0180,0A08,0000,1331   ;2728   XCT12D: D_R[1]
U 1331, 001D,2000,0180,0800,0010,1332   ;2729           A[U_Q-D,CLK.UBCC       ; CHECK THE RESULT.
U 1332, 0000,013C,0180,0800,0000,11B8   ;2730           Z?
U 11B8, 0000,003C,0180,0800,0000,11C2   ;2731   =0      J/ALUER2               ; RESULT INCORRECT!
U 11B9, 0000,003E,0180,0A38,0000,0001   ;2732           LAB_R[7],RETURN1
                                        ;2733   ;NOTE THAT ON THE OCCURRENCE OF EITHER ALUER0 OR ALUER1 OR
                                        ;2734   ;ALUER2 THE CONTENTS OF THE  RC SCRATCH PADS WHICH WILL BE DISPLAYED
                                        ;2735   ;IS:
                                        ;2736   ;       RC[0E] = EXPECTED RESULT
                                        ;2737   ;       RC[0D] = GOT RESULT
                                        ;2738   ;       RC[0C] = A OPERAND
                                        ;2739   ;       RC[0B] = B OPERAND
                                        ;2740   ;       RC[0A] = ALU FUNCTION AS GIVEN BY
                                        ;2741   ;
                                        ;2742   ;               0B      A
                                        ;2743   ;               0A      B
```

```
                                       ;2744   ;               09      NOT.A
                                       ;2745   ;               08      A.OR.B
                                       ;2746   ;               07      A.AND.B
                                       ;2747   ;               06      A.OR.NOT.B
                                       ;2748   ;               05      A.AND.NOT.B
                                       ;2749   ;               04      A.XOR.B
                                       ;2750   ;               03      A.MINUS.B.MINUS.1
                                       ;2751   ;               02      A.PLUS.B.PLUS.1
                                       ;2752   ;               01      A.MINUS.B (RLOG)
                                       ;2753   ;               00      A.PLUS.B (RLOG)
                                       ;2754   ;
                                       ;2755   =0
U 11BA, 0000,003D,0180,0800,0000,1333  ;2756   ALUER1: CALL,J/ALUERX   ;SET UP DATA
U 11BB, 0018,0039,0580,09C8,0000,11C4  ;2757           ERROR1,RC[9]_K[.1]      ;THIS ERROR DESIGNATES NO
                                       ;2758                           ;ALU CARRY OUT WAS DETECTED
                                       ;2759                           ;(ALU CR<31>=0) WHILE ONE WAS
                                       ;2760                           ;EXPECTED.
                                       ;2761   =0
U 11C0, 0000,003D,0180,0800,0000,1333  ;2762   ALUER0: CALL,J/ALUERX   ;SET UP THE DATA
U 11C1, 0003,003D,0180,09C8,0000,11C4  ;2763           ERROR1,RC[9]_0          ;THIS ERROR DESIGNATES
                                       ;2764                           ;AN UNEXPECTED ALU CARRY OUT OCCURRED.
                                       ;2765   =0
U 11C2, 0000,003D,0180,0800,0000,1333  ;2766   ALUER2: CALL,J/ALUERX   ;SET UP THE DATA
U 11C3, 0018,0039,0980,09C8,0000,11C4  ;2767           ERROR1,RC[9]_K[.2] ;RESULT INCORRECT.
                                       ;2768   ;THIS ROUTINE IS USED TO SETUP THE DATA WHEN
                                       ;2769   ;AN ERROR CALL IS TO BE MADE.
U 1333, 0000,003C,0180,0A08,0000,1334  ;2770   ALUERX: LAB_R[1]
U 1334, 0000,003C,0180,09F0,0000,1335  ;2771           RC[0E]_LA
U 1335, 0000,003C,0180,0A10,0000,1336  ;2772           LAB_R[2]
U 1336, 0000,003C,0180,09E8,0000,1337  ;2773           RC[0D]_LA
U 1337, 0000,003C,0180,0A18,0000,1338  ;2774           LAB_R[3]
U 1338, 0000,003C,0180,09E0,0000,1339  ;2775           RC[0C]_LA
U 1339, 0000,003C,0180,0A20,0000,133A  ;2776           LAB_R[4]
U 133A, 0000,003C,0180,09D8,0000,133B  ;2777           RC[0B]_LA
U 133B, 0000,003C,0180,0A48,0000,133C  ;2778           LAB_R[9]
U 133C, 0000,003C,0180,09D0,0000,133D  ;2779           RC[0A]_LA
U 133D, 0000,003E,0180,0800,0000,0001  ;2780           RETURNT
U 133E, 0000,003C,0180,0800,0000,11C8  ;2781   ALU100: NOP
```

```
                                              .PAGE   "TEST 5A       PSL REGISTER DATA INTEGRITY"
                                      ;***************************************************************************
                                      ;++
                                      ; TEST  5A      PSL REGISTER DATA INTEGRITY
                                      ;
                                      ; TEST DESCRIPTION
                                      ;       THIS TEST FLOATS A ZERO AND A ONE THRU THE PSL REGISTER BY
                                      ;       WRITING AND READING IT OVER THE ID BUS.
                                      ;
                                      ;       SUBTST 1 - FLOAT A ZERO THRU THE REGISTER     /
                                      ;       SUBTST 2 - FLOAT A ONE THRU THE REGISTER      /
                                      ;
                                      ; LOGIC DESCRIPTION
                                      ;       THIS TEST CHECKS LOGIC ON BOTH THE CEH AND ICL MODULE. THE LOGIC
                                      ;       TESTED IS THE ID BUS TRANCEIVERS, MULTIPLEXORS INTO THE BITS OF
                                      ;       THE PSL, THE PSL REGISTER, THE ID BUS MULTIPLEXOR,
                                      ;       AND THE ID BUS ADDRESS DECODE LOGIC FOR THE PSL.
                                      ;
                                      ; ERROR DESCRIPTION
                                      ;       DATA: EXPECTED VALUE OF THE PSL REGISTER
                                      ;             RECEIVED VALUE OF THE PSL REGISTER
                                      ;             LOOP COUNT--SHOWS WHAT BIT POSITION THE FLOATING ONE OR ZERO
                                      ;               IS CURRENTLY IN, I.E.
                                      ;                       20=BIT 0, 1F=BIT 1, 1E=BIT 2, ETC.
                                      ;
                                      ; SYNC POINT DESCRIPTION
                                      ;       SUBTST 1 - SYNC02--PSL IS LOADED
                                      ;                  SYNC03--PSL IS READ
                                      ;       SUBTST 2 - SYNC04--PSL IS LOADED
                                      ;                  SYNC05--PSL IS READ
                                      ;--
                                      ;**************************************************************************
                                      =0
U 11C8, 0000,003D,0180,0800,0000,10F4 CEHT1:  NEWTST
U 11C9, 0018,0038,0D80,09F8,0000,133F         RC[0F]_K[.3]
U 133F, 0818,0038,AD80,0800,0000,1340         D_K[.DFCF]                      ; GENERATE MASK FOR PSL
U 1340, 0B00,003C,4980,0800,0000,1341         D_D.SWAP,KMX/.FF
U 1341, 0019,0014,4980,0A80,0000,1342         R[0]_D+K[.FF]                   ; SAVE
U 1342, 0018,0038,0580,0AA8,0000,1343         R[5]_K[.1]                      ; SET INITIAL PATTERN
U 1343, 0018,0038,0580,09F0,0000,11CA         RC[0E]_K[.1]                    ; SET INITIAL EXPECTED VALUE
                                      ;///////////////////////////////////////////////////////////////
                                      ;+
                                      ; SUBTEST       1
                                      ; FIRST FLOAT A ZERO THRU THE PSL
                                      ;-
                                      =0
U 11CA, 0000,003D,0180,0800,0000,11D4 T1S1:   SUBTEST
U 11CB, 0818,0038,F180,0800,0000,1344         D_K[.FFFC]
U 1344, 081A,4014,0980,0800,0000,1345         D_D.SXT[WORD]+K[.2]             ; GENERATE INITIAL PATTERN
U 1345, 0001,003C,0180,09A8,0000,1346         RC[5]_D
U 1346, 081C,2034,0180,0A00,0000,1347         D_D.AND.R[0]                    ; MASK EXPECTED DATA
U 1347, 0001,003C,0180,09F0,0000,1348         RC[0E]_D                        ; SAVE
U 1348, 0018,0038,7580,09E0,0000,11D0         RC[0C]_K[.20]                   ; SET THE LOOP COUNT
U 11D0, 0000,003D,0180,0800,0000,11BE =0      ERLOOP
U 11D1, 0810,0038,0180,0970,0000,1349 CEHT1L2:D_RC[0E]
```

```
U 1349, 0000,003C,3D80,3C00,0000,134A   ;2837   SYNC02: ID[PSL]_D                          ; LOAD THE PATTERN
U 134A, 0000,003C,3DF0,2C00,0000,134B   ;2838   SYNC03: Q_ID[PSL]                          ; READ IT BACK
U 134B, 001C,0034,01C0,0A00,0000,134C   ;2839           Q_Q.AND.R[0]                       ; MASK
U 134C, 001D,2000,0180,0800,0010,134D   ;2840           ALU_Q-D,CLK.UBCC                   ; CHECK IT
U 134D, 0000,013C,0180,0800,0000,11D2   ;2841           Z?
U 11D2, 0001,203D,0180,09E8,0000,11CC   ;2842   =0      ERROR2,RC[0D]_Q                    ; BIT IN PSL FAILED
U 11D3, 0820,003C,0380,0A28,0000,134E   ;2843           ALU_R[5],D_ALU.LEFT,SI/MUL-,       ; GENERATE NEXT PATTERN
U 134E, 0001,003C,0180,0AA8,0000,134F   ;2844           R[5]_D
U 134F, 081C,2034,0180,0A00,0000,1350   ;2845           D_D.AND.R[0]                       ; MASK EXPECTED DATA
U 1350, 0001,003C,0180,09F0,0000,1351   ;2846           RC[0E]_D                           ; SAVE
U 1351, 0810,0038,0180,0960,0000,1352   ;2847           D_RC[0C]
U 1352, 0019,8000,0580,09E0,0010,1353   ;2848           RC[0C]_D-K[.1],CLK.UBCC,BYTE       ; CHECK LOOP COUNT
U 1353, 0000,013C,0180,0800,0000,11D8   ;2849           Z?
U 11D8, 0000,003C,0180,0800,0000,11D1   ;2850   =0      J/CEHT1L2
                                        ;2851   ;//////////////////////////////////////////////////////////////////
                                        ;2852   ;+
                                        ;2853   ; SUBTEST       2
                                        ;2854   ; NOW FLOAT A ONE THRU THE PSL
                                        ;2855   ;-
U 11D9, 0000,003C,0180,0800,0000,11DA   ;2856           NOP
                                        ;2857   =0
U 11DA, 0000,003D,0180,0800,0000,11D4   ;2858   T1S2:   SUBTEST
U 11DB, 0018,0038,7580,09E0,0000,11E0   ;2859           RC[0C]_K[.20]                      ; SET THE LOOP COUNT
U 11E0, 0000,003D,0180,0800,0000,11BE   ;2860   =0      ERLOOP
U 11E1, 0810,0038,0180,0970,0000,1354   ;2861   CEHT1L1:D_RC[0E]                           ; GET TEST DATA
U 1354, 0000,003C,3D80,3C00,0000,1355   ;2862   SYNC04: ID[PSL]_D                          ; LOAD THE PSL
U 1355, 0000,003C,3DF0,2C00,0000,1356   ;2863   SYNC05: Q_ID[PSL]                          ; READ IT BACK
U 1356, 001D,2000,0180,0800,0010,1357   ;2864           ALU_Q-D,CLK.UBCC                   ; CHECK
U 1357, 0000,013C,0180,0800,0000,11E2   ;2865           Z?
U 11E2, 0001,203D,0180,09E8,0000,11CC   ;2866   =0      ERROR2,RC[0D]_Q                    ; BIT IN PSL STUCK
U 11E3, 0830,0038,0180,0928,0000,1358   ;2867           ALU_RC[5],D_ALU.LEFT               ; GENERATE NEXT PATTERN
U 1358, 0001,003C,0180,0AA8,0000,1359   ;2868           R[5]_D                             ; SAVE
U 1359, 081C,2034,0180,0A00,0000,135A   ;2869           D_D.AND.R[0]                       ; MASK EXPECTED DATA
U 135A, 0001,003C,0180,09F0,0000,135B   ;2870           RC[0E]_D
U 135B, 0810,0038,0180,0960,0000,135C   ;2871           D_RC[0C]
U 135C, 0019,8000,0580,09E0,0010,135D   ;2872           RC[0C]_D-K[.1],CLK.UBCC,BYTE       ; DECREMENT LOOP COUNT
U 135D, 0000,013C,0180,0800,0000,11E4   ;2873           Z?
U 11E4, 0000,003C,0180,0800,0000,11E1   ;2874   =0      J/CEHT1L1                          ; CONTINUE
U 11E5, 0000,003C,0180,0800,0000,11E6   ;2875           NOP
```

```
                                            ;2876           .PAGE   "TEST 5B        ALU/A+B+PSL.C TEST"
                                            ;2877   ;*************************************************************
                                            ;2878   ;++
                                            ;2879   ; TEST  5B      ALU/A+B+PSL.C TEST
                                            ;2880   ;
                                            ;2881   ; TEST DESCRIPTION
                                            ;2882   ;       THIS IS A TEST OF THE ALU FUNCTION: A.PLUS.B.PLUS.PSLC.
                                            ;2883   ;       EVERY COMBINATION OF A<3:0> AND B<3:0> IS TRIED WITH
                                            ;2884   ;       PSL.C=0 AND WITH PSL.C=1.
                                            ;2885   ;
                                            ;2886   ; LOGIC DESCRIPTION
                                            ;2887   ;
                                            ;2888   ; ERROR DESCRIPTION
                                            ;2889   ;       EXPECTED RESULT
                                            ;2890   ;       GOT RESULT
                                            ;2891   ;       A OPERAND
                                            ;2892   ;       B OPERAND
                                            ;2893   ;       ERROR CODE:
                                            ;2894   ;               0 => PSL.C FAILED AT 0
                                            ;2895   ;               1 => PSL.C FAILED AT 1
                                            ;2896   ;       GOT RESULT +/- 1, DEPENDING ON THE EXPECTED PSL C BIT
                                            ;2897   ;
                                            ;2898   ;--
                                            ;2899   ;*************************************************************
                                            ;2900   =0
U 11E6, 0000,003D,0180,0800,0000,10F4       ;2901   ABC0:   NEWTST
U 11E7, 0018,0038,D580,09F8,0000,135E       ;2902           RC[0F]_K[.6]
U 135E, 0018,0038,8D80,0A80,0000,135F       ;2903           R[0]_K[.1F]             ; SET UP THE COUNTERS.
U 135F, 0018,0038,8D80,0A88,0000,11E8       ;2904           R[1]_K[.1F]
U 11E8, 0000,003D,0180,0800,0000,11BE       ;2905   =0      ERLOOP
U 11E9, 0800,003C,0180,0A00,0000,1360       ;2906   ABC1:   D_R[0]                  ; FIRST TEST THESE PATTERNS
U 1360, 0000,003C,01C0,0A08,0000,1361       ;2907           Q_R[1]                  ; WITH PSL.C=0.
U 1361, 081D,2014,0180,0A90,0000,1362       ;2908           A[U_Q+D,R[2]_ALU,D_ALU  ; CALCULATE THE EXPECTED
U 1362, 0019,0014,0580,0A98,0000,1363       ;2909           ALU_D[A+B]K[.1],R[3]_ALU ; RESULT.
U 1363, 0F00,003C,0180,0800,0000,1364       ;2910           D_0
U 1364, 0000,003C,3D80,3C00,0000,1365       ;2911           ID[PSL]_D               ; SET UP THE PSL.
U 1365, 0000,003C,01C0,0A00,0000,1366       ;2912           Q_R[0]                  ; SET UP THE OPERANDS.
U 1366, 0800,003C,0180,0A08,0000,1367       ;2913           D_R[1]
U 1367, 0001,203C,0180,09E0,0000,1368       ;2914           RC[0C]_Q
U 1368, 0001,003C,0180,09D8,0000,1369       ;2915           RC[0B]_D
U 1369, 081D,202C,0180,09E8,0000,136A       ;2916           ALU_Q[A+B+PSL.C]D,RC[0D]_ALU,D_ALU ; TEST INSTRUCTION.
U 136A, 0000,003C,01C0,0A10,0000,136B       ;2917           Q_R[2]
U 136B, 0001,203C,0180,09F0,0000,136C       ;2918           RC[0E]_Q
U 136C, 001D,2000,0180,0800,0010,136D       ;2919           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 136D, 0019,0114,0580,09C8,0000,11EA       ;2920           Z?,RC[9]_D+K[.1]
U 11EA, 0003,003D,0180,09D0,0000,11C4       ;2921   =0      ERROR1,RC[0A]_0         ; RESULT INCORRECT!
U 11EB, 0818,0038,0580,0800,0000,136E       ;2922           D_K[.1]                 ; NOW TEST THESE PATTERNS
U 136E, 0000,003C,3D80,3C00,0000,136F       ;2923           ID[PSL]_D               ; WITH PSL.C=1
U 136F, 0000,003C,01C0,0A00,0000,1370       ;2924           Q_R[0]
U 1370, 0800,003C,0180,0A08,0000,1371       ;2925           D_R[1]
U 1371, 081D,202C,0180,09E8,0000,1372       ;2926           A[U_Q[A+B+PSL.C]D,RC[0D]_ALU,D_ALU ; TEST INSTRUCTION.
U 1372, 0000,003C,01C0,0A18,0000,1373       ;2927           Q_R[3]
U 1373, 0001,203C,0180,09F0,0000,1374       ;2928           RC[0E]_Q
U 1374, 001D,2000,0180,0800,0010,1375       ;2929           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1375, 0019,0100,0580,09C8,0000,11EC       ;2930           Z?,RC[9]_D-K[.1]
```

```
U 11EC, 0018,0039,0580,09D0,0000,11C4    ;2931    =0      ERROR1,RC[0A]_K[.1]       ; RESULT INCORRECT!
U 11ED, 0000,003C,0180,0A08,0010,1376    ;2932            ALU_R[1],CLK.UBCC         ; FINISHED WITH THIS  A PATTERN?
U 1376, 0000,013C,0180,0800,0000,11EE    ;2933            Z?
U 11EE, 0018,0000,0580,0A88,0000,11E9    ;2934    =0      R[1]_LA-K[.1],J/ABC1      ; IF NOT INCREMENT B AND CONTINUE.
U 11EF, 0000,003C,0180,0A00,0010,1377    ;2935            ALU_R[0],CLK.UBCC         ; FINISHED TEST?
U 1377, 0000,013C,0180,0800,0000,11F0    ;2936            Z?
U 11F0, 0018,0000,0580,0A80,0000,1378    ;2937    =0      R[0]_LA-K[.1],J/ABC2      ; IF NOT INCREMENT A PATTERN
                                         ;2938                                      ; AND GO RESET B PATTERN.
U 11F1, 0000,003C,0180,0800,0000,1379    ;2939            J/ABC3                    ; DONE!
U 1378, 0018,0038,8D80,0A88,0000,11E9    ;2940    ABC2:   R[1]_K[.1F],J/ABC1        ; RESET B PATTERN AND CONTINUE.
U 1379, 0000,003C,0180,0800,0000,11F2    ;2941    ABC3:   NOP
```

```
                                        ;2942           .PAGE   "TEST 5C        SK ROM CHECKSUM TEST"
                                        ;2943   ;*************************************************************
                                        ;2944   ;++
                                        ;2945   ; TEST  5C      SK ROM CHECKSUM TEST
                                        ;2946   ;
                                        ;2947   ; TEST DESCRIPTION
                                        ;2948   ;       THIS IS A TEST OF THE SK ROM. EACH OF THE SK LOCATIONS
                                        ;2949   ;       (LOCATIONS 8 THROUGH 3E)
                                        ;2950   ;       IS REFERENCED AND A SUM IS KEPT OF THEM.
                                        ;2951   ;       BITS <31:16> OF THIS SUM ARE THEN CLEARED.
                                        ;2952   ;       THEN THIS 'CHECKSUM' IS COMPARED WITH THE VALUE OF
                                        ;2953   ;       KMX/3F WHICH HAS BEEN DESIGNATED THE CHECKSUM OF THE
                                        ;2954   ;       SK ROM.
                                        ;2955   ;
                                        ;2956   ; LOGIC DESCRIPTION
                                        ;2957   ;       TESTED HERE IS THE SK ROM, THE KMX SK INPUTS
                                        ;2958   ;       AND THE BMX KMX INPUTS. NOTE THAT THIS TEST ASSUMES
                                        ;2959   ;       SK LOCATION 3F CONTAINS THE CHECKSUM OF THE PREVIOUS
                                        ;2960   ;       LOCATIONS IN THE ROM.
                                        ;2961   ;
                                        ;2962   ; ERROR DESCRIPTION
                                        ;2963   ;       EXPECTED CHECKSUM (FROM KMX/3F)
                                        ;2964   ;       GOT CHECKSUM
                                        ;2965   ;
                                        ;2966   ;--
                                        ;2967   ;*************************************************************
                                        ;2968   =0
U 11F2, 0000,003D,0180,0800,0000,10F4   ;2969   KMXT0:  NEWTST
U 11F3, 0F00,003C,0180,0800,0000,11F4   ;2970           D_0                     ; SET UP SOME CONSTANTS
U 11F4, 0000,003D,0180,0800,0000,1011   ;2971   =0      CALL,J/DC1              ; AND COUNTERS FOR THE TEST.
U 11F5, 0001,003C,0180,0AA8,0000,11F6   ;2972           R[5]_D                  ; R[5]=1
U 11F6, 0F00,003D,0180,0800,0000,1013   ;2973   =0      D_0,CALL,J/DC3
U 11F7, 0001,003C,0180,0A80,0000,137A   ;2974           R[0]_D                  ; R[0]=3
U 137A, 0000,003C,01F8,0800,0000,11F8   ;2975           Q_0                     ; Q WILL CONTAIN THE COMMULATIVE SUM
                                        ;2976   =0
U 11F8, 0F00,003D,0180,0800,0000,101F   ;2977   KMX1:   D_0,CALL,J/DCF
U 11F9, 0001,003C,0180,0A88,0000,137B   ;2978           R[1]_D                  ; R[1]=F
                                        ;2979   ; USE THE BEN D3-0? TO GET TO THE MICRO INSTRUCTIONS WHICH
                                        ;2980   ; WILL ACTUALLY READ EACH SK VALUE.
U 137B, 0800,003C,0180,0A00,0000,11FA   ;2981   KMX2:   D_R[0]
U 11FA, 0800,193D,0180,0A08,0000,113C   ;2982   =0      D_R[1],D3-0?,CALL,J/KTAB0 ; GET THE NEXT CONSTANT INTO D
U 11FB, 001D,0014,01C0,0800,0000,137C   ;2983           ALU_D[A+B]Q,Q_ALU       ; ADD THIS VALUE INTO THE
                                        ;2984                                   ; COMMULATIVE SUM.
U 137C, 0800,003C,0180,0A08,0010,137D   ;2985           D_R[1],CLK.UBCC         ; CHECK THE FIRST COUNTER
U 137D, 0000,013C,0180,0A28,0000,11FC   ;2986           LAB_R[5],Z?
U 11FC, 000D,0000,0180,0A88,0000,137B   ;2987   =0      ALU_D[A-B]LB,R[1]_ALU,J/KMX2 ; IF NOT 0 DECREMENT AND CONTINUE.
U 11FD, 0800,003C,0180,0A00,0010,137E   ;2988           D_R[0],CLK.UBCC         ; OTHERWIES CHECK THE SECOND COUNTER.
U 137E, 0000,013C,0180,0A28,0000,11FE   ;2989           LAB_R[5],Z?
U 11FE, 000D,0000,0180,0A80,0000,11F8   ;2990   =0      ALU_D[A-B]LB,R[0]_ALU,J/KMX1 ; IF NOT 0 DECREMENT AND CONTINUE.
U 11FF, 0F00,003C,0180,0800,0000,1200   ;2991           D_0                     ; OTHERWISE CHECKSUM IS COMPLETE.
U 1200, 0000,003D,0180,0800,0000,1012   ;2992   =0      CALL,J/DC2
U 1201, 0001,003C,0180,09F8,0000,1202   ;2993           RC[0F]_D
U 1202, 0F00,003D,0180,0800,0000,1018   ;2994   =0      D_0,CALL,J/DC8
U 1203, 0500,003C,0180,0800,0000,137F   ;2995           D_D.LEFT,SI/ZERO
U 137F, 0001,003C,0180,0800,0082,1380   ;2996           SC_D                    ; SC=X10
```

```
U 1380, 0803,0010,0180,0800,0000,1381   ;2997           ALU_MASK+1,D_ALU        ; GENERATE MASK FOR UPPER
U 1381, 001D,2024,01C0,0800,0000,1382   ;2998           ALU_Q[ANDNOT]D,Q_ALU    ; 16 BITS OF CHECKSUM.
                                        ;2999                                   ; USE THIS MASK TO CLEAR
                                        ;3000                                   ; BITS 16 THROUGH 31 OF Q.
U 1382, 0818,0038,FD80,09F0,0000,1383   ;3001           D_K[3F],RC[0E]_K[3F]    ; GET THE CHECKSUM OUT OF KMX/3F.
U 1383, 0001,203C,0180,09E8,0000,1384   ;3002           RC[0D]_Q
U 1384, 001D,2000,0180,0800,0010,1385   ;3003           ALU_Q-D,CLK.UBCC        ; CHECK THE SUM
U 1385, 0000,013C,0180,0800,0000,1204   ;3004           Z?
U 1204, 0000,003D,0180,0800,0000,11C4   ;3005   =0      ERROR!                  ; INCORRECT!
U 1205, 0000,003C,0180,0800,0000,1386   ;3006           J/KMX3                  ; DONE
                                        ;3007   ; THESE TABLES ARE USED TO REFERENCE THE KMX VALUES.
                                        ;3008   =1100
U 113C, 0000,193C,0180,0800,0000,1140   ;3009   KTAB0:  D3-0?,J/KTAB1
U 113D, 0000,193C,0180,0800,0000,1160   ;3010           D3-0?,J/KTAB2
U 113E, 0000,193C,0180,0800,0000,1170   ;3011           D3-0?,J/KTAB3
U 113F, 0000,193C,0180,0800,0000,1180   ;3012           D3-0?,J/KTAB4
                                        ;3013   =0000
U 1140, 0F00,003E,0180,0800,0000,0001   ;3014   KTAB1:  D_0,RETURN1
U 1141, 0F00,003E,0180,0800,0000,0001   ;3015           D_0,RETURN1
U 1142, 0F00,003E,0180,0800,0000,0001   ;3016           D_0,RETURN1
U 1143, 0F00,003E,0180,0800,0000,0001   ;3017           D_0,RETURN1
U 1144, 0F00,003E,0180,0800,0000,0001   ;3018           D_0,RETURN1
U 1145, 0F00,003E,0180,0800,0000,0001   ;3019           D_0,RETURN1
U 1146, 0F00,003E,0180,0800,0000,0001   ;3020           D_0,RETURN1
U 1147, 0F00,003E,0180,0800,0000,0001   ;3021           D_0,RETURN1
U 1148, 0818,003A,2180,0800,0000,0001   ;3022           D_K[8],RETURN1
U 1149, 0818,003A,2580,0800,0000,0001   ;3023           D_K[9],RETURN1
U 114A, 0818,003A,2980,0800,0000,0001   ;3024           D_K[0A],RETURN1
U 114B, 0818,003A,2D80,0800,0000,0001   ;3025           D_K[0B],RETURN1
U 114C, 0818,003A,3180,0800,0000,0001   ;3026           D_K[0C],RETURN1
U 114D, 0818,003A,3580,0800,0000,0001   ;3027           D_K[0D],RETURN1
U 114E, 0818,003A,3980,0800,0000,0001   ;3028           D_K[0E],RETURN1
U 114F, 0818,003A,3D80,0800,0000,0001   ;3029           D_K[0F],RETURN1
                                        ;3030   =0000
U 1160, 0818,003A,4180,0800,0000,0001   ;3031   KTAB2:  D_K[10],RETURN1
U 1161, 0818,003A,4580,0800,0000,0001   ;3032           D_K[11],RETURN1
U 1162, 0818,003A,4980,0800,0000,0001   ;3033           D_K[12],RETURN1
U 1163, 0818,003A,4D80,0800,0000,0001   ;3034           D_K[13],RETURN1
U 1164, 0818,003A,5180,0800,0000,0001   ;3035           D_K[14],RETURN1
U 1165, 0818,003A,5580,0800,0000,0001   ;3036           D_K[15],RETURN1
U 1166, 0818,003A,5980,0800,0000,0001   ;3037           D_K[16],RETURN1
U 1167, 0818,003A,5D80,0800,0000,0001   ;3038           D_K[17],RETURN1
U 1168, 0818,003A,6180,0800,0000,0001   ;3039           D_K[18],RETURN1
U 1169, 0818,003A,6580,0800,0000,0001   ;3040           D_K[19],RETURN1
U 116A, 0818,003A,6980,0800,0000,0001   ;3041           D_K[1A],RETURN1
U 116B, 0818,003A,6D80,0800,0000,0001   ;3042           D_K[1B],RETURN1
U 116C, 0818,003A,7180,0800,0000,0001   ;3043           D_K[1C],RETURN1
U 116D, 0818,003A,7580,0800,0000,0001   ;3044           D_K[1D],RETURN1
U 116E, 0818,003A,7980,0800,0000,0001   ;3045           D_K[1E],RETURN1
U 116F, 0818,003A,7D80,0800,0000,0001   ;3046           D_K[1F],RETURN1
                                        ;3047   =0000
U 1170, 0818,003A,8180,0800,0000,0001   ;3048   KTAB3:  D_K[20],RETURN1
U 1171, 0818,003A,8580,0800,0000,0001   ;3049           D_K[21],RETURN1
U 1172, 0818,003A,8980,0800,0000,0001   ;3050           D_K[22],RETURN1
U 1173, 0818,003A,8D80,0800,0000,0001   ;3051           D_K[23],RETURN1
```

```
U 1174, 0818,003A,9180,0800,0000,0001   ;3052           D_K[24],RETURN1
U 1175, 0818,003A,9580,0800,0000,0001   ;3053           D_K[25],RETURN1
U 1176, 0818,003A,9980,0800,0000,0001   ;3054           D_K[26],RETURN1
U 1177, 0818,003A,9D80,0800,0000,0001   ;3055           D_K[27],RETURN1
U 1178, 0818,003A,A180,0800,0000,0001   ;3056           D_K[28],RETURN1
U 1179, 0818,003A,A580,0800,0000,0001   ;3057           D_K[29],RETURN1
U 117A, 0818,003A,A980,0800,0000,0001   ;3058           D_K[2A],RETURN1
U 117B, 0818,003A,AD80,0800,0000,0001   ;3059           D_K[2B],RETURN1
U 117C, 0818,003A,B180,0800,0000,0001   ;3060           D_K[2C],RETURN1
U 117D, 0818,003A,B580,0800,0000,0001   ;3061           D_K[2D],RETURN1
U 117E, 0818,003A,B980,0800,0000,0001   ;3062           D_K[2E],RETURN1
U 117F, 0818,003A,BD80,0800,0000,0001   ;3063           D_K[2F],RETURN1
                                        ;3064   =0000
U 1180, 0818,003A,C180,0800,0000,0001   ;3065   KTAB4:  D_K[30],RETURN1
U 1181, 0818,003A,C580,0800,0000,0001   ;3066           D_K[31],RETURN1
U 1182, 0818,003A,C980,0800,0000,0001   ;3067           D_K[32],RETURN1
U 1183, 0818,003A,CD80,0800,0000,0001   ;3068           D_K[33],RETURN1
U 1184, 0818,003A,D180,0800,0000,0001   ;3069           D_K[34],RETURN1
U 1185, 0818,003A,D580,0800,0000,0001   ;3070           D_K[35],RETURN1
U 1186, 0818,003A,D980,0800,0000,0001   ;3071           D_K[36],RETURN1
U 1187, 0818,003A,DD80,0800,0000,0001   ;3072           D_K[37],RETURN1
U 1188, 0818,003A,E180,0800,0000,0001   ;3073           D_K[38],RETURN1
U 1189, 0818,003A,E580,0800,0000,0001   ;3074           D_K[39],RETURN1
U 118A, 0818,003A,E980,0800,0000,0001   ;3075           D_K[3A],RETURN1
U 118B, 0818,003A,ED80,0800,0000,0001   ;3076           D_K[3B],RETURN1
U 118C, 0818,003A,F180,0800,0000,0001   ;3077           D_K[3C],RETURN1
U 118D, 0818,003A,F580,0800,0000,0001   ;3078           D_K[3D],RETURN1
U 118E, 0818,003A,F980,0800,0000,0001   ;3079           D_K[3E],RETURN1
U 118F, 0F00,003E,0180,0800,0000,0001   ;3080           D_0,RETURN1
U 1386, 0000,003C,0180,0800,0000,1206   ;3081   KMX3:   NOP
```

```
                                            .PAGE   "TEST 5D        DFMX AND SHF MUX TEST"
                                    ;***************************************************************
                                    ;++
                                    ; TEST  5D      DFMX AND SHF MUX TEST
                                    ;
                                    ; TEST DESCRIPTION
                                    ;       THIS IS A TEST OF THE ABILITY OF THE DFMX TO UNPACK THE
                                    ;       FRACTION OF A FLOATING POINT NUMBER. ALSO TESTED ARE
                                    ;       VARIOUS SHF MUX FUNCTIONS. THE DATA PATTERNS ARE
                                    ;       THOSE GENERATED BY FLOATING A 1 THROUGH 0'S AND A 0 THROUGH 1'S.
                                    ;       NOTE THAT THE SI MUX FOR THE SHF MUX IS NOT COMPREHENSIVELY
                                    ;       TESTED HERE (ESPECIALLY NOT SI/ALU31).
                                    ;       SUBTEST 1 TESTS DFMX UNPACK FRACTION
                                    ;       SUBTEST 2 TESTS SHF/LEFT
                                    ;       SUBTEST 3 TESTS SHF/RIGHT
                                    ;       SUBTEST 4 TESTS SHF/RIGHT2
                                    ;       SUBTEST 5 TESTS SHF/ALU.DT,DT/BYTE
                                    ;       SUBTEST 6 TESTS SHF/ALU.DT,DT/WORD
                                    ;       SUBTEST 7 TESTS SHF/ALU.DT,DT/LONG
                                    ;       SUBTEST 8 TESTS SHF/LEFT3
                                    ;
                                    ; LOGIC DESCRIPTION
                                    ;
                                    ; ERROR DESCRIPTION
                                    ;       EXPECTED RESULT
                                    ;       GOT RESULT
                                    ;       OPERAND USED
                                    ;       FUNCTION BEING TESTED AS GIVEN BY:
                                    ;               7       SHF/ALU,DFMX/FRACT
                                    ;               6       SHF/LEFT,SI/2
                                    ;                               AND
                                    ;                       SHF/LEFT,SI/7
                                    ;               5       SHF/RIGHT,SI/2
                                    ;                               AND
                                    ;                       SHF/RIGHT,SI/7
                                    ;               4       SHF/RIGHT2,SI/2
                                    ;                               AND
                                    ;                       SHF/RIGHT2,SI/7
                                    ;               3       SHF/ALU.DT,DT/BYTE,SI/7
                                    ;               2       SHF/ALU.DT,DT/WORD,SI/2
                                    ;               1       SHF/ALU.DT,DT/LONG,SI/2
                                    ;               0       SHF/LEFT3,SI/7
                                    ;
                                    ;--
                                    ;***************************************************************
                                    =0
U 1206, 0000,003D,0180,0800,0000,10F4  SHF1:   NEWTST
U 1207, 0018,0038,1180,09F8,0000,1208          RC[OF]_K[.4]
U 1208, 0F00,003D,0180,0800,0000,1017  =0      D_0,CALL,J/DC7          ; SET UP FUNCTION POINTER
U 1209, 0001,003C,0180,0AA8,0000,120A          R[5]_D                  ; R[5]=7
                                    =0
U 120A, 0000,003D,0180,0800,0000,11D4  SHF2:   SUBTEST
U 120B, 0818,0038,0580,0A98,0000,120C          D_K[.1],R[3]_K[.1]      ; SET UP THE INITIAL DATA PATTERN.
                                    =0
U 120C, 0500,003D,0180,0800,0000,1010  SHF3:   D_D.LEFT,SI/ZERO,CALL,J/DC0
```

```
U 120D, 0001,003C,0180,0AA0,0000,1387   ;3137           R[4]_D                  ; SET UP A COUNTER FOR THE
                                        ;3138                                   ; DATA PATTERNS.
U 1387, 0800,003C,0180,0A28,0000,120E   ;3139           D_R[5]                  ; INDEX TO THE ROUTINE
U 120E, 0003,193D,0180,0AF8,0000,1190   ;3140   =0      R[0F]_0,CALL,D3-0?,J/SHFLPR ; WHICH SETS UP THE LOOP ON ERROR
                                        ;3141                                   ; ADDRESS FOR THIS FUNCTION.
U 120F, 0800,003C,0180,0A28,0000,1210   ;3142   SHF4:   D_R[5]                  ; INDEX TO THE ROUTINE WHICH
U 1210, 0000,193D,01F8,0800,0000,11A0   ;3143   =0      Q_0,CALL,D3-0?,J/SHFTAB ; SIMULATES EXECUTES AND CHECKS
                                        ;3144                                   ; THE RESULT OF THE FUNCTION.
U 1211, 0000,0028,0180,0A98,0000,1388   ;3145           R[3]_NOT.LA             ; COMPLEMENT THE DATA.
U 1388, 0800,003C,01F8,0A28,0000,1212   ;3146           Q_0,D_R[5]              ; GO TEST THE FUNCTION WITH
U 1212, 0019,3901,05C0,0800,0000,11A0   ;3147   =0      Q_Q-K[.1],CALL,D3-0?,J/SHFTAB ; THE COMPLEMENT PATTERN.
U 1213, 0000,0028,0180,0A98,0000,1389   ;3148           R[3]_NOT.LA             ; COMPLEMENT THE DATA BACK TO
                                        ;3149                                   ; ITS ORIGINAL STATE.
U 1389, 0000,003C,0180,0A20,0000,138A   ;3150           LAB_R[4]                ; SEE IF ALL PATTERNS HAVE BEEN
U 138A, 0018,0000,0580,0AA0,0010,138B   ;3151           R[4]_LA-K[.1],CLK.UBCC  ; TESTED WITH THIS FUNCTION.
U 138B, 0000,013C,0180,0800,0000,1214   ;3152           Z?
U 1214, 0800,003C,0180,0A18,0000,138D   ;3153   =0      D_R[3],J/SHF5           ; IF NOT SHIFT PATTERN AND
                                        ;3154                                   ; CONTINUE
U 1215, 0000,003C,0180,0A28,0010,138C   ;3155           ALU_R[5],CLK.UBCC       ; OTHERWISE SEE IF ALL FUNCTIONS
U 138C, 0000,013C,0180,0800,0000,1216   ;3156           Z?,J/SHF6               ; HAVE BEEN TESTED.
U 138D, 0500,003C,0180,0800,0000,138E   ;3157   SHF5:   D_D.LEFT,SI/ZERO        ; SHIFT DATA PATTERN AND
U 138E, 0001,003C,0180,0A98,0000,120F   ;3158           R[3]_D,J/SHF4           ; CONTINUE TESTING THIS FUNCTION.
                                        ;3159   =0
U 1216, 0018,0000,0580,0AA8,0000,120A   ;3160   SHF6:   R[5]_LA-K[.1],J/SHF2    ; TEST NEXT FUNCTION.
U 1217, 0000,003C,0180,0800,0000,13ED   ;3161           J/SHF100                ; DONE!
                                        ;3162   ;///////////////////////////////////////////////////////////////
                                        ;3163   ;+
                                        ;3164   ; SUBTEST       1
                                        ;3165   ; SIMULATE, EXECUTE AND CHECK THE FUNCTION DFMX_FRACTION
                                        ;3166   ;-
                                        ;3167   =0
U 1218, 0000,003D,0180,0800,0000,11BE   ;3168   SLPRA:  ERLOOP
U 1219, 0800,003C,0180,0A78,0000,138F   ;3169           D_R[0F]                 ; SEE IF THIS CALL WAS TO
U 138F, 0000,0D3C,0180,0800,0000,119D   ;3170           SIGNS?                  ; SET THE LOOP ON ERROR
U 119D, C018,003A,C180,0AF8,0000,0001   ;3171   =101    R[0F]_K[.FFFF],RETURN1  ; ADDRESS OR IF AN ERROR
                                        ;3172                                   ; OCCURRED WITH THE LOOP ON ERROR
                                        ;3173                                   ; OPTION SELECTED BY THE USER.
U 119F, 0800,003C,0180,0A18,0000,1390   ;3174           D_R[3]                  ; SET UP THE OPERAND AND
U 1390, 0F00,003C,0180,0800,0000,1391   ;3175   DFMXA:  D_0                     ; CALCULATE THE EXPECTED
U 1391, 0018,0038,C180,0800,0000,121A   ;3176           A[U_K[.FFFF]            ; RESULT.
U 121A, 0500,003D,0380,0800,0000,1010   ;3177   =0      D_D.LEFT,SI/7,CALL,J/DC0
U 121B, 0001,003C,0180,0AC0,0000,1392   ;3178           R[8]_D                  ; SHIFT COUNTER=16
U 1392, 0800,003C,01C0,0A18,0000,121C   ;3179           Q_R[3],D_R[3]
                                        ;3180   =0
U 121C, 0500,003C,0028,0A40,0000,1393   ;3181   DFMXB:  Q_Q.LEFT,D_D.LEFT,SI/0,LAB_R[8],J/DFMXC
U 121D, 0000,003C,0180,0800,0000,121E   ;3182           J7DFMXD
U 1393, 0018,0000,0580,0AC0,0010,1394   ;3183   DFMXC:  R[8]_LA-K[.1],CLK.UBCC
U 1394, 0000,013C,0180,0800,0000,121C   ;3184           Z?,J7DFMXB
                                        ;3185   =0
U 121E, 0100,003D,0180,0800,0000,1010   ;3186   DFMXD:  D_D.LEFT2,SI/ZERO,CALL,J/DC0
U 121F, 0100,003C,0180,0800,0000,1395   ;3187           D_D.LEFT2,SI/ZERO
U 1395, 0500,003C,0180,0800,0000,1396   ;3188           D_D.LEFT,SI/ZERO
U 1396, 0018,0038,C180,0800,0000,1397   ;3189           A[U_K[.FFFF]
U 1397, 0600,003C,0380,0800,0000,1398   ;3190           D_D.RIGHT,SI/7          ; INSERT HIDDEN BIT.
U 1398, 0600,003C,0180,0800,0000,1399   ;3191           D_D.RIGHT,SI/ZERO       ; INSERT GUARD BIT.
```

```
U 1399, 0001,003C,0180,0A88,0000,139A   ;3192           R[1]_D                  ; SAVE EXPECTED RESULT.
U 139A, 0800,003C,0180,0A18,0000,139B   ;3193   DFMXE:  D_R[3]                  ; SET UP OPERAND.
U 139B, 0901,003C,0180,0800,0000,139C   ;3194           D_D(FRAC)               ; TEST INSTRUCTION WHICH
                                        ;3195                                   ; UNPACKS THE FRACTION
                                        ;3196                                   ; INTO THE D REGISTER.
U 139C, 0001,003C,0180,0A90,0000,139D   ;3197           R[2]_D                  ; SAVE THE RESULT.
U 139D, 0000,003C,01C0,0A08,0000,139E   ;3198           Q_R[T]
U 139E, 001D,2000,0180,0800,0010,139F   ;3199           ALU_Q-D,CLK.UBCC        ; CHECK THE RESULT.
U 139F, 0000,013C,0180,0800,0000,1220   ;3200           Z?
U 1220, 0000,003C,0180,0800,0000,13E4   ;3201   =0      J/SHFER                 ; REPORT FAILURE.
U 1221, 0000,003C,01C0,0A18,0000,13A0   ;3202   DFMXF:  Q_R[3]                  ; SET UP THE OPERAND
U 13A0, 0001,203C,01C8,0800,0000,13A1   ;3203           Q_Q(FRAC)               ; TEST INSTRUCTION WHICH
                                        ;3204                                   ; UNPACKS THE FRACTION INTO
                                        ;3205                                   ; THE Q REGISTER.
U 13A1, 0001,203C,0180,0A90,0000,13A2   ;3206           R[2]_Q                  ; SAVE THE RESULT.
U 13A2, 0800,003C,0180,0A08,0000,13A3   ;3207           D_R[T]
U 13A3, 001D,2000,0180,0800,0010,13A4   ;3208           ALU_Q-D,CLK.UBCC        ; CHECK THE RESULT.
U 13A4, 0000,013C,0180,0800,0000,1222   ;3209           Z?
U 1222, 0000,003C,0180,0800,0000,13E4   ;3210   =0      J/SHFER                 ; REPORT FAILURE.
U 1223, 0000,003E,0180,0A18,0000,0001   ;3211           LAB_R[3],RETURN1
                                        ;3212   ;///////////////////////////////////////////////////////////
                                        ;3213   ;+
                                        ;3214   ; SUBTEST       2
                                        ;3215   ; SIMULATE, EXECUTE AND CHECK THE RESULT OF THE SHF/LEFT FUNCTION
                                        ;3216   ;-
                                        ;3217   =0
U 1224, 0000,003D,0180,0800,0000,11BE   ;3218   SLPRB:  ERLOOP
U 1225, 0800,003C,0180,0A78,0000,13A5   ;3219           D_R[0F]                 ; SEE IF THIS CALL WAS TO
U 13A5, 0000,0D3C,0180,0800,0000,11AD   ;3220           SIGNS?                  ; SET THE LOOP ON ERROR
U 11AD, 0018,003A,C180,0AF8,0000,0001   ;3221   =101    R[0F]_K[.FFFF],RETURN1  ; ADDRESS OR IF AN ERROR
                                        ;3222                                   ; OCCURRED WITH THE LOOP ON ERROR
                                        ;3223                                   ; OPTION SELECTED BY THE USER.
U 11AF, 0800,003C,0180,0A18,0000,13A6   ;3224           D_R[3]                  ; SET UP THE OPERAND.
U 13A6, 0001,203C,0180,0800,0010,13A7   ;3225   SHFB:   ALU_Q,CLK.UBCC          ; SEE IF SI/2 OR SI/7
U 13A7, 0000,013C,0180,0800,0000,1226   ;3226           Z?
U 1226, 0500,003C,0180,0800,0000,13A9   ;3227   =0      D_D.LEFT,SI/ZERO,J/SHFB1 ; CALCULATE EXPECTED RESULT.
U 1227, 0018,0038,C180,0800,0000,13A8   ;3228           ALU_K[.FFFF]
U 13A8, 0500,003C,0380,0800,0000,13A9   ;3229           D_D.LEFT,SI/7
U 13A9, 0001,003C,0180,0A88,0000,13AA   ;3230   SHFB1:  R[1]_D                  ; SAVE EXPECTED RESULT
U 13AA, 0800,003C,0180,0A18,0000,13AB   ;3231           D_R[3]                  ; SET UP THE OPERAND
U 13AB, 0001,203C,0180,0AC8,0010,13AC   ;3232           R[9]_Q,CLK.UBCC
U 13AC, 0000,013C,0180,0800,0000,1228   ;3233           Z?
                                        ;3234   ; TEST INSTRUCTION
U 1228, 0821,003C,0100,0A88,0000,13AD   ;3235   =0      ALU_D,SHF/LEFT,SI/2,DK/SHF,R[1]_SHF,J/SHFB2
U 1229, 0821,003C,0380,0A88,0000,13AD   ;3236           ALU_D,SHF/LEFT,SI/7,DK/SHF,R[1]_SHF
U 13AD, 0000,003C,01C0,0A08,0000,13AE   ;3237   SHFB2:  Q_R[1]
U 13AE, 001D,2000,0180,0800,0010,13AF   ;3238           ALU_Q-D,CLK.UBCC        ; CHECK RESULT.
U 13AF, 0000,013C,01C0,0A48,0000,122A   ;3239           Z?,Q_R[9]
U 122A, 0000,003C,0180,0800,0000,13E4   ;3240   =0      J/SHFER                 ; REPORT ERROR.
U 122B, 0000,003E,0180,0A18,0000,0001   ;3241           LAB_R[3],RETURN1
                                        ;3242   ;///////////////////////////////////////////////////////////
                                        ;3243   ;+
                                        ;3244   ; SUBTEST       3
                                        ;3245   ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE SHF/RIGHT FUNCTION.
                                        ;3246   ;-
```

```
                                           ;3247    =0
U 122C, 0000,003D,0180,0800,0000,11BE      ;3248    SLPRC:  ERLOOP
U 122D, 0800,003C,0180,0A78,0000,13B0      ;3249            D_R[OF]                     ; SEE IF THIS CALL WAS TO
U 13B0, 0000,0D3C,0180,0800,0000,11B5      ;3250            SIGNS?                      ; SET THE LOOP ON ERROR
U 11B5, 0018,003A,C180,0AF8,0000,0001      ;3251    =101    R[OF]_K[.FFFF],RETURN1      ; ADDRESS OR IF AN ERROR
                                           ;3252                                        ; OCCURRED WITH THE LOOP ON ERROR
                                           ;3253                                        ; OPTION SELECTED BY THE USER.
U 11B7, 0800,003C,0180,0A18,0000,13B1      ;3254            D_R[3]                      ; SET UP THE OPERAND.
U 13B1, 0001,203C,0180,0800,0010,13B2      ;3255    SHFC:   A[U_Q,CLK.UBCC              ; SEE IF SI/2 OR SI/7
U 13B2, 0000,013C,0180,0800,0000,122E      ;3256            Z?
U 122E, 0600,003C,0180,0800,0000,13B4      ;3257    =0      D_D.RIGHT,SI/ZERO,J/SHFC1 ; CALCULATE THE EXPECTED RESULT
U 122F, 0018,0038,C180,0800,0000,13B3      ;3258            A[U_K[.FFFF]
U 13B3, 0600,003C,0380,0800,0000,13B4      ;3259            D_D.RIGHT,SI/7
U 13B4, 0001,003C,0180,0A88,0000,13B5      ;3260    SHFC1:  R[1]_D                      ; SAVE THE EXPECTED RESULT.
U 13B5, 0800,003C,0180,0A18,0000,13B6      ;3261            D_R[3]                      ; SET UP THE OPERAND
U 13B6, 0001,203C,0180,0AC8,0010,13B7      ;3262            R[9]_Q,CLK.UBCC
U 13B7, 0000,013C,0180,0800,0000,1230      ;3263            Z?
                                           ;3264    ; TEST INSTRUCTION
U 1230, 0841,003C,0100,0A90,0000,13B8      ;3265    =0      ALU_D,SHF/RIGHT,SI/2,DK/SHF,R[2]_SHF,J/SHFC2
U 1231, 0841,003C,0380,0A90,0000,13B8      ;3266            ALU_D,SHF/RIGHT,SI/7,DK/SHF,R[2]_SHF
U 13B8, 0000,003C,01C0,0A08,0000,13B9      ;3267    SHFC2:  Q_R[1]
U 13B9, 001D,2000,0180,0800,0010,13BA      ;3268            A[U_Q-D,CLK.UBCC            ; CHECK THE RESULT.
U 13BA, 0000,013C,01C0,0A48,0000,1232      ;3269            Z?,Q_R[9]
U 1232, 0000,003C,0180,0800,0000,13E4      ;3270    =0      J/SHFER                     ; REPORT ERROR.
U 1233, 0000,003E,0180,0A18,0000,0001      ;3271            LAB_R[3],RETURN1
                                           ;3272    ;////////////////////////////////////////////////////////////
                                           ;3273    ;+
                                           ;3274    ; SUBTEST       4
                                           ;3275    ; SIMULATE EXECUTE AND CHECK THE RESULT OF THE SHF/RIGHT2 FUNCTION.
                                           ;3276    ;-
                                           ;3277    =0
U 1234, 0000,003D,0180,0800,0000,11BE      ;3278    SLPRD:  ERLOOP
U 1235, 0800,003C,0180,0A78,0000,13BB      ;3279            D_R[OF]                     ; SEE IF THIS CALL WAS TO
U 13BB, 0000,0D3C,0180,0800,0000,11BD      ;3280            SIGNS?                      ; SET THE LOOP ON ERROR
U 11BD, 0018,003A,C180,0AF8,0000,0001      ;3281    =101    R[OF]_K[.FFFF],RETURN1      ; ADDRESS OR IF AN ERROR
                                           ;3282                                        ; OCCURRED WITH THE LOOP ON ERROR
                                           ;3283                                        ; OPTION SELECTED BY THE USER.
U 11BF, 0800,003C,0180,0A18,0000,13BC      ;3284            D_R[3]                      ; SET UP THE OPERAND
U 13BC, 0001,203C,0180,0800,0010,13BD      ;3285    SHFD:   A[U_Q,CLK.UBCC              ; SEE IF SI/2 OR SI/7
U 13BD, 0000,013C,0180,0800,0000,1236      ;3286            Z?
U 1236, 0200,003C,0180,0800,0000,13BF      ;3287    =0      D_D.RIGHT2,SI/ZERO,J/SHFD1 ; CALCULATE THE EXPECTED RESULT
U 1237, 0018,0038,C180,0800,0000,13BE      ;3288            A[U_K[.FFFF]
U 13BE, 0200,003C,0380,0800,0000,13BF      ;3289            D_D.RIGHT2,SI/7
U 13BF, 0001,003C,0180,0A88,0000,13C0      ;3290    SHFD1:  R[1]_D                      ; SAVE THE EXPECTED RESULT.
U 13C0, 0800,003C,0180,0A18,0000,13C1      ;3291            D_R[3]                      ; SET UP THE OPERAND.
U 13C1, 0001,203C,0180,0AC8,0010,13C2      ;3292            R[9]_Q,CLK.UBCC
U 13C2, 0000,013C,0180,0800,0000,1238      ;3293            Z?
                                           ;3294    ; TEST INSTRUCTION
U 1238, 0881,003C,0100,0A90,0000,13C3      ;3295    =0      ALU_D,SHF/RIGHT2,SI/2,DK/SHF,R[2]_SHF,J/SHFD2
U 1239, 0881,003C,0380,0A90,0000,13C3      ;3296            ALU_D,SHF/RIGHT2,SI/7,DK/SHF,R[2]_SHF
U 13C3, 0000,003C,01C0,0A08,0000,13C4      ;3297    SHFD2:  Q_R[1]
U 13C4, 001D,2000,0180,0800,0010,13C5      ;3298            A[U_Q-D,CLK.UBCC            ; CHECK THE RESULT.
U 13C5, 0000,013C,01C0,0A48,0000,123A      ;3299            Z?,Q_R[9]
U 123A, 0000,003C,0180,0800,0000,13E4      ;3300    =0      J/SHFER                     ; REPORT ERROR
U 123B, 0000,003E,0180,0A18,0000,0001      ;3301            LAB_R[3],RETURN1
```

```
                                         ;3302   ;///////////////////////////////////////////////////////////////
                                         ;3303   ;+
                                         ;3304   ; SUBTEST       5
                                         ;3305   ; SIMULATE EXECUTE AND CHECK THE FUNCTION SHF/ALU.DT,DT/BYTE
                                         ;3306   ;-
                                         ;3307   =0
U 123C, 0000,003D,0180,0800,0000,11BE    ;3308   SLPRE:  ERLOOP
U 123D, 0800,003C,0180,0A78,0000,13C6    ;3309           D_R[OF]                    ; SEE IF THIS CALL WAS TO
U 13C6, 0000,0D3C,0180,0800,0000,11C5    ;3310           SIGNS?                     ; SET THE LOOP ON ERROR
U 11C5, 0018,003A,C180,0AF8,0000,0001    ;3311   =101    R[OF]_K[.FFFF],RETURN1     ; ADDRESS OR IF AN ERROR
                                         ;3312                                      ; OCCURRED WITH THE LOOP ON ERROR
                                         ;3313                                      ; OPTION SELECTED BY THE USER.
U 11C7, 0800,003C,0180,0A18,0000,13C7    ;3314           D_R[3]                     ; SET UP THE OPERAND.
U 13C7, 0001,003C,01E0,0A88,0000,13C8    ;3315   SHFE:   Q_D,R[1]_D                 ; SAVE EXPECTED RESULT.
                                         ;3316   ; TEST INSTRUCTION:
U 13C8, 0861,803C,0380,0800,0000,13C9    ;3317           ALU_D,SHF/ALU.DT,DT/BYTE,SI/7,DK/SHF
U 13C9, 0001,003C,0180,0A90,0000,13CA    ;3318           R[2]_D                     ; SAVE THE RESULT.
U 13CA, 001D,2000,0180,0800,0010,13CB    ;3319           ALU_Q-D,CLK.UBCC           ; CHECK THE RESULT.
U 13CB, 0000,013C,0180,0800,0000,123E    ;3320           Z?
U 123E, 0000,003C,0180,0800,0000,13E4    ;3321   =0      J/SHFER                    ; REPORT THE ERROR.
U 123F, 0000,003E,0180,0A18,0000,0001    ;3322           LAB_R[3],RETURN1
                                         ;3323   ;///////////////////////////////////////////////////////////////
                                         ;3324   ;+
                                         ;3325   ; SUBTEST       6
                                         ;3326   ; SIMULATE, EXECUTE AND CHECK THE RESULT OF THE FUNCTION SHF/ALU.DT,DT/WORD
                                         ;3327   ;-
                                         ;3328   =0
U 1240, 0000,003D,0180,0800,0000,11BE    ;3329   SLPRF:  ERLOOP
U 1241, 0800,003C,0180,0A78,0000,13CC    ;3330           D_R[OF]                    ; SEE IF THIS CALL WAS TO
U 13CC, 0000,0D3C,0180,0800,0000,11CD    ;3331           SIGNS?                     ; SET THE LOOP ON ERROR
U 11CD, 0018,003A,C180,0AF8,0000,0001    ;3332   =101    R[OF]_K[.FFFF],RETURN1     ; ADDRESS OR IF AN ERROR
                                         ;3333                                      ; OCCURRED WITH THE LOOP ON ERROR
                                         ;3334                                      ; OPTION SELECTED BY THE USER.
U 11CF, 0800,003C,0180,0A18,0000,13CD    ;3335           D_R[3]                     ; SET UP THE OPERAND
U 13CD, 0500,003C,0180,0800,0000,13CE    ;3336   SHFF:   D_D.LEFT,SI/ZERO           ; CALCULATE THE EXPECTED RESULT
U 13CE, 0001,003C,01E0,0A88,0000,13CF    ;3337           Q_D,R[1]_D                 ; SAVE THE EXPECTED RESULT.
U 13CF, 0800,003C,0180,0A18,0000,13D0    ;3338           D_R[3]                     ; SET UP THE OPERAND
                                         ;3339   ; TEST INSTRUCTION:
U 13D0, 0861,403C,0100,0800,0000,13D1    ;3340           ALU_D,SHF/ALU.DT,DT/WORD,SI/2,DK/SHF
U 13D1, 0001,003C,0180,0A90,0000,13D2    ;3341           R[2]_D                     ; SAVE THE RESULT
U 13D2, 001D,2000,0180,0800,0010,13D3    ;3342           ALU_Q-D,CLK.UBCC           ; CHECK THE RESULT.
U 13D3, 0000,013C,0180,0800,0000,1242    ;3343           Z?
U 1242, 0000,003C,0180,0800,0000,13E4    ;3344   =0      J/SHFER                    ; REPORT THE ERROR.
U 1243, 0000,003E,0180,0A18,0000,0001    ;3345           LAB_R[3],RETURN1
                                         ;3346   ;///////////////////////////////////////////////////////////////
                                         ;3347   ;+
                                         ;3348   ; SUBTEST       7
                                         ;3349   ; SIMULATE, EXECUTE AND CHECK THE RESULT OF SHF/ALU.DT,DT/LONG
                                         ;3350   ;-
                                         ;3351   =0
U 1244, 0000,003D,0180,0800,0000,11BE    ;3352   SLPRG:  ERLOOP
U 1245, 0800,003C,0180,0A78,0000,13D4    ;3353           D_R[OF]                    ; SEE IF THIS CALL WAS TO
U 13D4, 0000,0D3C,0180,0800,0000,11D5    ;3354           SIGNS?                     ; SET THE LOOP ON ERROR
U 11D5, 0018,003A,C180,0AF8,0000,0001    ;3355   =101    R[OF]_K[.FFFF],RETURN1     ; ADDRESS OR IF AN ERROR
                                         ;3356                                      ; OCCURRED WITH THE LOOP ON ERROR
```

```
                                      ;3357                                           ; OPTION SELECTED BY THE USER.
U 11D7, 0800,003C,0180,0A18,0000,13D5 ;3358           D_R[3]                          ; SET UP THE OPERAND.
U 13D5, 0100,003C,0180,0800,0000,13D6 ;3359   SHFG:   D_D.LEFT2,SI/ZERO               ; CALCULATE THE EXPECETED RESULT.
U 13D6, 0001,003C,01E0,0A88,0000,13D7 ;3360           Q_D,R[1]_D                      ; SAVE THE EXPECTED RESULT.
U 13D7, 0800,003C,0180,0A18,0000,13D8 ;3361           D_R[3]                          ; SET UP THE OPERAND
                                      ;3362   ; TEST INSTRUCTION:
U 13D8, 0861,003C,0100,0A90,0000,13D9 ;3363           ALU_D,SHF/ALU.DT,DT/LONG,SI/2,DK/SHF,R[2]_SHF
U 13D9, 001D,2000,0180,0800,0010,13DA ;3364           ALU_Q-D,CLK.UBCC                ; CHECK THE RESULT.
U 13DA, 0000,013C,0180,0800,0000,1246 ;3365           Z?
U 1246, 0000,003C,0180,0800,0000,13E4 ;3366   =0      J/SHFER                         ; REPORT THE ERROR.
U 1247, 0000,003E,0180,0A18,0000,0001 ;3367           LAB_R[3],RETURN1
                                      ;3368   ;/////////7!//////////////////////////////////////////////////////////
                                      ;3369   ;+
                                      ;3370   ; SUBTEST       8
                                      ;3371   ; SIMULATE, EXECUTE AND CHECK THE RESULT OF SHF/LEFT3
                                      ;3372   ;-
                                      ;3373   =0
U 1248, 0000,003D,0180,0800,0000,11BE ;3374   SLPRH:  ERLOOP
U 1249, 0800,003C,0180,0A78,0000,13DB ;3375           D_R[OF]                         ; SEE IF THIS CALL WAS TO
U 13DB, 0000,0D3C,0180,0800,0000,11DD ;3376           SIGNS?                          ; SET THE LOOP ON ERROR
U 11DD, 0018,003A,C180,0AF8,0000,0001 ;3377   =101    R[OF]_K[.FFFF],RETURN1          ; ADDRESS OR IF AN ERROR
                                      ;3378                                           ; OCCURRED WITH THE LOOP ON ERROR
                                      ;3379                                           ; OPTION SELECTED BY THE USER.
U 11DF, 0800,003C,0180,0A18,0000,13DC ;3380           D_R[3]                          ; SET UP THE OPERAND
U 13DC, 0100,003C,0180,0800,0000,13DD ;3381   SHFH:   D_D.LEFT2,SI/ZERO               ; CALCULATE THE EXPECTED RESULT
U 13DD, 0500,003C,0180,0800,0000,13DE ;3382           D_D.LEFT,SI/ZERO
U 13DE, 0001,003C,01E0,0A88,0000,13DF ;3383           Q_D,R[1]_D                      ; SAVE THE EXPECTED RESULT.
U 13DF, 0800,003C,0180,0A18,0000,13E0 ;3384           D_R[3]                          ; SET UP THE OPERAND
U 13E0, 08A1,403C,0380,0800,0000,13E1 ;3385           A[U_D,SHF/LEFT3,DT/WORD,SI/7,DK/SHF ; TEST INSTRUCTION
U 13E1, 0001,003C,0180,0A90,0000,13E2 ;3386           R[2]_D                          ; SAVE THE RESULT
U 13E2, 001D,2000,0180,0800,0010,13E3 ;3387           ALU_Q-D,CLK.UBCC                ; CHECK THE RESULT.
U 13E3, 0000,013C,0180,0800,0000,124A ;3388           Z?
U 124A, 0000,003C,0180,0800,0000,13E4 ;3389   =0      J/SHFER                         ; REPORT THE ERROR.
U 124B, 0000,003E,0180,0A18,0000,0001 ;3390           LAB_R[3],RETURN1
                                      ;3391   ; THIS TABLE IS USED TO INDEX TO THE ROUTINES WHICH SET
                                      ;3392   ; THE LOOP ON ERROR ADDRESS FOR EACH FUNCTION.
                                      ;3393   =0000
U 1190, 0000,003C,0180,0800,0000,1248 ;3394   SHFLPR: J/SLPRH
U 1191, 0000,003C,0180,0800,0000,1244 ;3395           J/SLPRG
U 1192, 0000,003C,0180,0800,0000,1240 ;3396           J/SLPRF
U 1193, 0000,003C,0180,0800,0000,123C ;3397           J/SLPRE
U 1194, 0000,003C,0180,0800,0000,1234 ;3398           J/SLPRD
U 1195, 0000,003C,0180,0800,0000,122C ;3399           J/SLPRC
U 1196, 0000,003C,0180,0800,0000,1224 ;3400           J/SLPRB
U 1197, 0000,003C,0180,0800,0000,1218 ;3401           J/SLPRA
                                      ;3402   =
                                      ;3403   ; THIS TABLE IS USED TO INDEX TO THE ROUTINE WHICH
                                      ;3404   ; SIMUALTES EXECUTES AND CHECKS THE RESULT OF EACH FUNCTION.
                                      ;3405   =0000
U 11A0, 0800,003C,0180,0A18,0000,13DC ;3406   SHFTAB: D_R[3],J/SHFH
U 11A1, 0800,003C,0180,0A18,0000,13D5 ;3407           D_R[3],J/SHFG
U 11A2, 0800,003C,0180,0A18,0000,13CD ;3408           D_R[3],J/SHFF
U 11A3, 0800,003C,0180,0A18,0000,13C7 ;3409           D_R[3],J/SHFE
U 11A4, 0800,003C,0180,0A18,0000,13BC ;3410           D_R[3],J/SHFD
U 11A5, 0800,003C,0180,0A18,0000,13B1 ;3411           D_R[3],J/SHFC
```

```
U 11A6, 0800,003C,0180,0A18,0000,13A6   ;3412           D_R[3],J/SHFB
U 11A7, 0800,003C,0180,0A18,0000,1390   ;3413           D_R[3],J/DFMXA
                                        ;3414   =
                                        ;3415   ; WHEN AN ERROR IS DETECTED THE CONTENTS OF THE RC REGISTERS
                                        ;3416   ; WILL BE TYPED:
                                        ;3417   ;
                                        ;3418   ;       RC[0E] = EXPECTED RESULT
                                        ;3419   ;       RC[0D] = GOT RESULT
                                        ;3420   ;       RC[0C] = OPERAND
                                        ;3421   ;       RC[0B] = FUNCTION, AS DEFINED BELOW
                                        ;3422   ;
                                        ;3423   ;               7       SHF/ALU,DFMX/FRACT.
                                        ;3424   ;               6       SHF/LEFT,SI/2
                                        ;3425   ;                           AND
                                        ;3426   ;                       SHF/LEFT,SI/7
                                        ;3427   ;               5       SHF/RIGHT,SI/2
                                        ;3428   ;                           AND
                                        ;3429   ;                       SHF/RIGHT,SI/7
                                        ;3430   ;               4       SHF/RIGHT2,SI/2
                                        ;3431   ;                           AND
                                        ;3432   ;                       SHF/RIGHT2,SI/7
                                        ;3433   ;               3       SHF/ALU.DT,DT/BYTE,SI/7
                                        ;3434   ;               2       SHF/ALU.DT,DT/WORD,SI/2
                                        ;3435   ;               1       SHF/ALU.DT,DT/LONG,SI/2
                                        ;3436   ;               0       SHF/LEFT3,SI/7
                                        ;3437   ;
U 13E4, 0000,003C,0180,0A08,0000,13E5   ;3438   SHFER:  LAB_R[1]
U 13E5, 0000,003C,0180,09F0,0000,13E6   ;3439           RC[0E]_LA
U 13E6, 0000,003C,0180,0A10,0000,13E7   ;3440           LAB_R[2]
U 13E7, 0000,003C,0180,09E8,0000,13E8   ;3441           RC[0D]_LA
U 13E8, 0000,003C,0180,0A18,0000,13E9   ;3442           LAB_R[3]
U 13E9, 0000,003C,0180,09E0,0000,13EA   ;3443           RC[0C]_LA
U 13EA, 0000,003C,0180,0A28,0000,13EB   ;3444           LAB_R[5]
U 13EB, 0000,003C,0180,09D8,0000,13EC   ;3445           RC[0B]_LA
U 13EC, 0000,003D,0180,0800,0000,11C4   ;3446           ERROR1
U 13ED, 0000,003C,0180,0800,0000,124C   ;3447   SHF100: NOP
                                        ;3448   =0
U 124C, 0000,003D,0180,0800,0000,10F4   ;3449   DUMMY1: NEWTST
```

```
;                                  Location / Line Number Index

;Location        0/8       1/9       2/A       3/B       4/C       5/D       6/E       7/F

U 0000 - 0FFF Unused
U 1000           1871:     1838      1845=     1861=     1839      2395=     1840      2398=
U 1008           1862=     1863=     1972=     1973=     1975=     1976=     2258=     2259=
U 1010           1953=     1954=     1955=     1956=     1957=     1958=     1959=     1960=
U 1018           1961=     1962=     1963=     1964=     1965=     1966=     1967=     1968=
U 1020           2001=     2002=     2003=     2004=     2005=     2006=     2007=     2008=
U 1028           2009=     2010=     2011=     2012=     2013=     2014=     2015=     2016=
U 1030           2046=     2047=     2048=     2049=     2050=     2051=     2052=     2053=
U 1038           2054=     2055=     2056=     2057=     2058=     2059=     2060=     2061=
U 1040           2018=     2019=     2022=     2023=     1841      2416=     1842      2419=
U 1048           2034=     2035=     2120=     2121=     1843      2437=     1902:     2440=
U 1050           2123=     2124=     2126=     2127=     1844      2460=     1864      2463=
U 1058           2131=     2132=     1905:     1865      1866      2494=     1908:     2497=
U 1060           2064=     2065=     2066=     2067=     2068=     2069=     2070=     2071=
U 1068           2072=     2073=     2074=     2075=     2076=     2077=     2078=     2079=
U 1070           2083=     2084=     2085=     2086=     2087=     2088=     2089=     2090=
U 1078           2091=     2092=     2093=     2094=     2095=     2096=     2097=     2098=
U 1080           2101=     2102=     2103=     2104=     2105=     2106=     2107=     2108=
U 1088           2109=     2110=     2111=     2112=     2113=     2114=     2115=     2116=
U 1090           2134=     2135=     2469=     2470=     2137=     2138=     2471=     2472=
U 1098           2233=     2234=     2243=     2244=     2249=     2250=     2269=     2270=
U 10A0           2357=     2358=     2359=     2360=     2361=     2362=     2363=     2364=
U 10A8           2365=     2366=     2367=     2368=     2275=     2276=     2613=     2614=
U 10B0           2373=     2374=     2375=     2376=     2377=     2378=     2379=     2380=
U 10B8           2381=     2382=     2383=     2384=     2279=     2280=     2619=     2620=
U 10C0           2282=     2283=     2503=     2504=     2290=     2291=     2505=     2506=
U 10C8           2298=     2299=     2301=     2302=     2307=     2308=     2648=     2649=
U 10D0           2315=     2316=     2317=     2318=     1867      2528=     1868      2531=
U 10D8           2326=     2328=     2330=     2331=     2336=     2337=     2653=     2654=
U 10E0           2343=     2344=     2347=     2348=     1869      2552=     1870      2555=
U 10E8           2350=     2353=     2392=     2393=     2405=     2406=     2682=     2683=
U 10F0           2413=     2414=     2426=     2427=     1880      2576=     1881      2579=
U 10F8           2434=     2435=     2449=     2450=     2457=     2458=     2687=     2688=
U 1100           1825:     1826:     1827:     1828:     1829:     1830:     1831:     1832:
U 1108           1833:     1882      2475=     2476=     1834:     1835:     1836:     1837:
U 1110           2483=     2484=     2491=     2492=     1883      2605=     1884      2608=
U 1118           2509=     2510=     2517=     2518=     2525=     2526=     2716=     2717=
U 1120           2541=     2542=     2549=     2550=     1885      2640=     1886      2643=
U 1128           2564=     2565=     2573=     2574=     2594=     2595=     2721=     2722=
U 1130           2602=     2603=     2622=     2623=     1887      2674=     1888      2677=
U 1138           2625=     2626=     2629=     2630=     3009=     3010=     3011=     3012=
U 1140           3014=     3015=     3016=     3017=     3018=     3019=     3020=     3021=
U 1148           3022=     3023=     3024=     3025=     3026=     3027=     3028=     3029=
U 1150           2637=     2638=     2656=     2657=     1889      1928:     2659=     2660=
U 1158           2663=     2664=     2671=     2672=     1890      2708=     1891      2711=
U 1160           3031=     3032=     3033=     3034=     3035=     3036=     3037=     3038=
U 1168           3039=     3040=     3041=     3042=     3043=     3044=     3045=     3046=
U 1170           3048=     3049=     3050=     3051=     3052=     3053=     3054=     3055=
U 1178           3056=     3057=     3058=     3059=     3060=     3061=     3062=     3063=
U 1180           3065=     3066=     3067=     3068=     3069=     3070=     3071=     3072=
U 1188           3073=     3074=     3075=     3076=     3077=     3078=     3079=     3080=
U 1190           3394=     3395=     3396=     3397=     3398=     3399=     3400=     3401=
U 1198           2690=     2691=     2693=     2694=     1892      3171=     1893      3174=
;Location          0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 11A0             3406=    3407=    3408=    3409=    3410=    3411=    3412=    3413=
U 11A8             2697=    2698=    2705=    2706=    1894     3221=    1895     3224=
U 11B0             2724=    2725=    2727=    2728=    1896     3251=    1897     3254=
U 11B8             2731=    2732=    2756=    2757=    1898     3281=    1899     3284=
U 11C0             2762=    2763=    2766=    2767=    1900     3311=    1901     3314=
U 11C8             2815=    2816=    2828=    2829=    1903     3332=    1904     3335=
U 11D0             2835=    2836=    2842=    2843=    1936     3355=    1937     3358=
U 11D8             2850=    2856=    2858=    2859=    1943     3377=    1944     3380=
U 11E0             2860=    2861=    2866=    2867=    2874=    2875=    2901=    2902=
U 11E8             2905=    2906=    2921=    2922=    2931=    2932=    2934=    2935=
U 11F0             2937=    2939=    2969=    2970=    2971=    2972=    2973=    2974=
U 11F8             2977=    2978=    2982=    2983=    2987=    2988=    2990=    2991=
U 1200             2992=    2993=    2994=    2995=    3005=    3006=    3128=    3129=
U 1208             3130=    3131=    3133=    3134=    3136=    3137=    3140=    3142=
U 1210             3143=    3145=    3147=    3148=    3153=    3155=    3160=    3161=
U 1218             3168=    3169=    3177=    3178=    3181=    3182=    3186=    3187=
U 1220             3201=    3202=    3210=    3211=    3218=    3219=    3227=    3228=
U 1228             3235=    3236=    3240=    3241=    3248=    3249=    3257=    3258=
U 1230             3265=    3266=    3270=    3271=    3278=    3279=    3287=    3288=
U 1238             3295=    3296=    3300=    3301=    3308=    3309=    3321=    3322=
U 1240             3329=    3330=    3344=    3345=    3352=    3353=    3366=    3367=
U 1248             3374=    3375=    3389=    3390=    3449=    1945     1948     1949
U 1250             1950     1951     1969     1970     1974     1977     1978     1979
U 1258             1980     1981     1982     1983     1984     1985     1986     1987
U 1260             1988     1989     1990     1991     1992     1993     1994     1995
U 1268             1996     2017     2024     2025     2026     2027     2028     2029
U 1270             2030     2031     2036     2037     2038     2039     2040     2041
U 1278             2042     2043     2125     2136     2245     2246     2247     2248
U 1280             2251     2252     2253     2254     2255     2256     2257     2260
U 1288             2261     2262     2263     2264     2265     2266     2267     2268
U 1290             2281     2284     2285     2286     2292     2293     2294     2295
U 1298             2296     2297     2300     2303     2305     2306     2309     2319
U 12A0             2320     2321     2322     2323     2324     2325     2329     2332
U 12A8             2333     2334     1929:    2335     2339     2340     2341     2342
U 12B0             2345     2394     2399     2400     2401     2402     2403     2404
U 12B8             2415     2420     2421     2422     2423     2424     2425     2436
U 12C0             2441     2442     2443     2444     2445     2446     2447     2448
U 12C8             2459     2464     2465     2466     2467     2473     2474     2477
U 12D0             2478     2479     2480     2481     2482     2493     2498     2499
U 12D8             2500     2501     2507     2508     2511     2512     2513     2514
U 12E0             2515     2516     2527     2532     2533     2534     2536     2537
U 12E8             2538     2539     2540     2551     2556     2557     2558     2559
U 12F0             2560     2561     2562     2563     2575     2580     2581     2582
U 12F8             2583     2584     2585     2586     2587     2588     2589     2590
U 1300             2591     2592     2593     2604     2609     2610     2611     2612
U 1308             2616     2617     2618     2621     2624     2627     2628     2639
U 1310             2644     2645     2646     2647     2650     2651     2652     2655
U 1318             2658     2661     2662     2673     2678     2679     2680     2681
U 1320             2684     2685     2686     2689     2692     2695     2696     2707
U 1328             2712     2713     2714     2715     2718     2719     2720     2723
U 1330             2726     2729     2730     2770     2771     2772     2773     2774
U 1338             2775     2776     2777     2778     2779     2780     2781     2817
U 1340             2818     2819     2820     2821     2830     2831     2832     2833
```

```
;Location       0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348          2834    2837    2838    2839    2840    2841    2844    2845
U 1350          2846    2847    2848    2849    2862    2863    2864    2865
U 1358          2868    2869    2870    2871    2872    2873    2903    2904
U 1360          2907    2908    2909    2910    2911    2912    2913    2914
U 1368          2915    2916    2917    2918    2919    2920    2923    2924
U 1370          2925    2926    2927    2928    2929    2930    2933    2936
U 1378          2940    2941    2975    2981    2985    2986    2989    2996
U 1380          2997    2998    3001    3002    3003    3004    3081    3139
U 1388          3146    3150    3151    3152    3156    3157    3158    3170
U 1390          3175    3176    3179    3183    3184    3188    3189    3190
U 1398          3191    3192    3193    3194    3197    3198    3199    3200
U 13A0          3203    3206    3207    3208    3209    3220    3225    3226
U 13A8          3229    3230    3231    3232    3233    3237    3238    3239
U 13B0          3250    3255    3256    3259    3260    3261    3262    3263
U 13B8          3267    3268    3269    3280    3285    3286    3289    3290
U 13C0          3291    3292    3293    3297    3298    3299    3310    3315
U 13C8          3317    3318    3319    3320    3331    3336    3337    3338
U 13D0          3340    3341    3342    3343    3354    3359    3360    3361
U 13D8          3363    3364    3365    3376    3381    3382    3383    3384
U 13E0          3385    3386    3387    3388    3438    3439    3440    3441
U 13E8          3442    3443    3444    3445    3446    3447
U 13F0          1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8          1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH22       1022

Used            1022
Remaining

Total microwords used in memory U: 1022
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH22.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3      Control ROM Field Definitions
; 548    Register Transfer Macro Definitions
; 1413   Non-transfer Functions
; 1485   Branch Enable Macro Definitions
; 1564   MICRO DIAGNOSTIC DEFINED MACROS
; 1806   MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2139   TEST 5E SC AND KMX/SC TEST
; 2209   TEST 5F SC BEN TEST A
; 2256   TEST 60 SC BEN TEST B
; 2295   TEST 61 SC BEN TEST C
; 2376   TEST 62 MASK TEST
; 2412   TEST 63 SMX/ALU.EXP TEST
; 2464   TEST 64 DAL SHIFTER TEST
; 2593   TEST 65 EALU/A+1, EAMX/SC AND SMX/EALU TEST
; 2646   TEST 66 EALU/A TEST
; 2696   TEST 67 EBMX/KMX AND EALU/B TEST
; 2745   TEST 68 FE AND SMX/FE TEST
; 2795   TEST 69 EBMX/FE TEST
; 2845   TEST 6A EBMX/AMX.EXP TEST
; 2902   TEST 6B STATE REGISTER AND EAMX/STATE TEST
; 2965   TEST 6C EALU TEST
; 3302   TEST 6D EALU/NABS.A-B TEST
; 3348   TEST 6E EALU/NABS.A-B ROM TEST
```

```
;1      .NOLIST
;1804   .LIST
;1805
```

```
                                        ;1806           .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                        ;1807   .REGION/1000,13FF
                                        ;1808   ;+
                                        ;1809   ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                        ;1810   ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                        ;1811   ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                        ;1812   ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                        ;1813   ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                        ;1814   ;
                                        ;1815   ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                        ;1816   ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                        ;1817   ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                        ;1818   ;       R[OF] AND DO A RETURNO.
                                        ;1819   ;
                                        ;1820   ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                        ;1821   ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                        ;1822   ; TO THE CONSOLE.
                                        ;1823   ;
                                        ;1824   ;-
U 1100, 0000,003C,1980,0800,0084,7005   ;1825   1100:   SC_K[ZERO],J/TRPH1          ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001   ;1826   1101:   SC_K[.1],J/TRPH0            ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001   ;1827   1102:   SC_K[.2],J/TRPH0            ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001   ;1828   1103:   SC_K[.3],J/TRPH0            ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001   ;1829   1104:   SC_K[.4],J/TRPH0            ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001   ;1830   1105:   SC_K[.6],J/TRPH0            ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001   ;1831   1106:   SC_K[.9],J/TRPH0            ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001   ;1832   1107:   SC_K[.7],J/TRPH0            ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001   ;1833   1108:   SC_K[.8],J/TRPH0            ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7005   ;1834   110C:   SC_K[.C],J/TRPH1            ; RDS
U 110D, 0000,003C,8980,0800,0084,7005   ;1835   110D:   SC_K[.D],J/TRPH1            ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001   ;1836   110E:   SC_K[.10],J/TRPH0           ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7005   ;1837   110F:   SC_K[.F],J/TRPH1            ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,1002   ;1838   TRPH0:  Q_ID[USTACK]
U 1002, 0C00,003C,01E0,0800,0000,1006   ;1839           Q_D,D_Q
U 1006, 0000,003C,8180,3C00,0000,100C   ;1840           ID[USTACK]_D
U 100C, 0C00,003C,01E0,0800,0000,100E   ;1841           Q_D,D_Q
U 100E, 0000,003C,01C0,0A78,0000,1042   ;1842           Q_R[OF]
U 1042, 0001,2024,0180,0800,0010,1046   ;1843           A[U_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 1046, 0000,013C,0180,0800,0000,1004   ;1844           Z?                              ; BRANCH IF NO
U 1004, 0001,2036,0180,0AF8,0000,0000   ;1845   =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN
                                        ;1846   ;+
                                        ;1847   ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                        ;1848   ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                        ;1849   ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                        ;1850   ;
                                        ;1851   ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                        ;1852   ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                        ;1853   ;             FAULT STATUS REGISTER
                                        ;1854   ;             SBI ERROR REGISTER
                                        ;1855   ;             TIMEOUT ADDRESS REGISTER
                                        ;1856   ;             MAINTENANCE REGISTER
                                        ;1857   ;             CACHE PARITY REGISTER
                                        ;1858   ;             TB ERROR REGISTER 1
                                        ;1859   ;             TB ERROR REGISTER 0
                                        ;1860   ;-
```

```
U 1005, 0018,0038,1D80,09E8,0000,1008   ;1861   TRPH1:  RC[0D]_SC
U 1008, 0000,003D,D980,0800,0084,71F7   ;1862   =0      SETRCF[.9]
U 1009, 0000,003C,49F0,2C00,0000,104C   ;1863           Q_ID[TBER0]
U 104C, 0001,203C,4DF0,2DB0,0000,1054   ;1864           RC[6]_Q,Q_ID[TBER1]
U 1054, 0001,203C,65F0,2DB8,0000,1056   ;1865           RC[7]_Q,Q_ID[SBI.ERR]
U 1056, 0001,203C,6DF0,2DD8,0000,1097   ;1866           RC[0B]_Q,Q_ID[FAULT]
U 1097, 0001,203C,75F0,2DE0,0000,10A7   ;1867           RC[0C]_Q,Q_ID[MAINT]
U 10A7, 0001,203C,79F0,2DC8,0000,10AA   ;1868           RC[9]_Q,Q_ID[PARITY]
U 10AA, 0001,203C,69F0,2DC0,0000,10AE   ;1869           RC[8]_Q,Q_ID[TIME.ADDR]
U 10AE, 0001,203C,81F0,2DD0,0000,1000   ;1870           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,111E   ;1871   1000:   RC[0E]_Q,ERROR1
                                        ;1872   ;+
                                        ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1875   ;                NEWTST
                                        ;1876   ;                ERLOOP
                                        ;1877   ;                ERROR1
                                        ;1878   ;                ERROR2
                                        ;1879   ;
U 10B2, 0000,003C,65F8,0800,0084,70B6   ;1880   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 10B6, 0818,0038,8D80,0800,0000,10BC   ;1881           D_K[.1F]                        ; ...
U 10BC, 0D00,003C,0180,0800,0000,10BE   ;1882           D_DAL.SC
U 10BE, 0000,003C,3D80,3C00,0000,10C4   ;1883           ID[PSL]_D                       ; WRITE THE PSL
U 10C4, 0818,0038,0580,0800,0000,10C6   ;1884           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 10C6, 0D00,003C,0180,0800,0000,10DC   ;1885           D_DAL.SC
U 10DC, 0F00,003C,3180,3C00,0000,10DE   ;1886           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 10DE, 0000,003C,5D80,3C00,0000,10E4   ;1887           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 10E4, 0000,003C,3980,3C00,0000,10E6   ;1888           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 10E6, 0000,003C,2980,3C00,0000,10EC   ;1889           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 10EC, 0000,003C,4980,3C00,0000,10EE   ;1890           ID[TBER0]_D                     ; SHUT OFF THE TB
U 10EE, 0818,0038,C180,0800,0000,10F4   ;1891           D_K[.FFFF]
U 10F4, 0000,003C,6580,3C00,0000,10F6   ;1892           ID[SBI.ERR]_D
U 10F6, 0F00,003C,6D80,3C00,0000,10FC   ;1893           ID[FAULT]_D,D_0
U 10FC, 0000,003C,6D80,3C00,0000,10FE   ;1894           ID[FAULT]_D
U 10FE, 0000,003C,6580,3C00,0000,1109   ;1895           ID[SBI.ERR]_D
U 1109, 0003,003C,0180,09F0,0000,1114   ;1896           RC[0E]_0
U 1114, 0003,003C,0180,0AF8,0000,1116   ;1897           R[0F]_0
U 1116, 0003,003C,0180,09E8,0000,105E   ;1898           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 111C, 0818,0038,0980,0800,0000,105E   ;1899   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 111E, 0810,0038,0180,0978,0000,1154   ;1900   ERROR1: D_RC[0F]
U 1154, 0819,0034,4D80,0800,0000,104E   ;1901           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1902   104E:   D_D.OR.K[.4],J/CALLCON
U 11F3, 0810,0038,0180,0978,0000,11F4   ;1903   ERROR2: D_RC[0F]
U 11F4, 0819,0034,4D80,0800,0000,105A   ;1904           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1905   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1906   105E:
                                        ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1908           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1909   ;+
                                        ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1912   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1913   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1914   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1915   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5    ;1916    13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6    ;1917    13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7    ;1918    13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8    ;1919    13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9    ;1920    13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA    ;1921    13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB    ;1922    13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC    ;1923    13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD    ;1924    13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE    ;1925    13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF    ;1926    13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155    ;1927    13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA    ;1928    1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,11F5    ;1929    12AA:   NOP
                                         ;1930    ;+
                                         ;1931    ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                         ;1932    ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                         ;1933    ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                         ;1934    ; TYPING IT.
                                         ;1935    ;-
U 11F5, 0810,0038,4D80,0978,0000,11F6    ;1936    SUBTST: D_RC[OF],KMX/.FF00
U 11F6, 0019,4016,4D80,09F8,0000,0001    ;1937            RC[OF]_D+K[.FF00],WORD,RETURN1
                                         ;1938    ;+
                                         ;1939    ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                         ;1940    ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                         ;1941    ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                         ;1942    ;-
U 11F7, 0010,0038,01C0,0978,0000,11F8    ;1943    SETRCF: Q_RC[OF]
U 11F8, 0019,2034,4DC0,0800,0000,11F9    ;1944            Q_Q.AND.K[.FF00]
U 11F9, 0019,2032,1D80,09F8,0000,0001    ;1945            RC[OF]_Q.OR.SC,RETURN1
                                         ;1946
                                         ;1947    ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 11FA, 0118,0038,1B80,0800,0000,11FE    ;1948    S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 11FB, 0118,0038,0B80,0800,0000,11FE    ;1949    S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 11FC, 0118,0038,0780,0800,0000,11FE    ;1950    S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 11FD, 0118,0038,C380,0800,0000,11FE    ;1951    S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
                                         ;1952    =0000
U 1010, 0018,0038,1980,0800,0000,11FA    ;1953    DC0:    ALU_0(K),J/S00
U 1011, 0018,0038,1980,0800,0000,11FB    ;1954    DC1:    ALU_0(K),J/S01
U 1012, 0018,0038,1980,0800,0000,11FC    ;1955    DC2:    ALU_0(K),J/S10
U 1013, 0018,0038,1980,0800,0000,11FD    ;1956    DC3:    ALU_0(K),J/S11
U 1014, 0018,0038,0980,0800,0000,11FA    ;1957    DC4:    ALU_K[.2],J/S00
U 1015, 0018,0038,0980,0800,0000,11FB    ;1958    DC5:    ALU_K[.2],J/S01
U 1016, 0018,0038,0980,0800,0000,11FC    ;1959    DC6:    ALU_K[.2],J/S10
U 1017, 0018,0038,0980,0800,0000,11FD    ;1960    DC7:    ALU_K[.2],J/S11
U 1018, 0018,0038,0580,0800,0000,11FA    ;1961    DC8:    ALU_K[.1],J/S00
U 1019, 0018,0038,0580,0800,0000,11FB    ;1962    DC9:    ALU_K[.1],J/S01
U 101A, 0018,0038,0580,0800,0000,11FC    ;1963    DCA:    ALU_K[.1],J/S10
U 101B, 0018,0038,0580,0800,0000,11FD    ;1964    DCB:    ALU_K[.1],J/S11
U 101C, 0018,0038,C180,0800,0000,11FA    ;1965    DCC:    ALU_K[.FFFF],J/S00
U 101D, 0018,0038,C180,0800,0000,11FB    ;1966    DCD:    ALU_K[.FFFF],J/S01
U 101E, 0018,0038,C180,0800,0000,11FC    ;1967    DCE:    ALU_K[.FFFF],J/S10
U 101F, 0018,0038,C180,0800,0000,11FD    ;1968    DCF:    ALU_K[.FFFF],J/S11
U 11FE, 0100,003E,0380,0800,0000,0001    ;1969    SX:     D_D.LEFT2,SI/7,RETURN1
U 11FF, 0018,0038,01C0,0800,0000,100A    ;1970    DC.6:   Q_K[.8]
```

```
                                        ;1971   =0
U 100A, 0000,003D,0180,0800,0000,1016   ;1972   DC.6A:  CALL,J/DC6
U 100B, 0019,2000,05C0,0800,0010,1200   ;1973           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1200, 0000,013C,0180,0800,0000,1040   ;1974           Z?
U 1040, 0000,003C,0180,0800,0000,100A   ;1975   =0      J/DC.6A
U 1041, 0000,003E,0180,0800,0000,0001   ;1976           RETURN1
U 1201, 0018,0038,0580,0800,0000,1202   ;1977   DCAAAA: ALU_K[.1]
U 1202, 0118,0038,0780,0800,0000,1203   ;1978           ALU_K[.1],D_D.LEFT2,SI/7
U 1203, 0118,0038,0780,0800,0000,1204   ;1979           ALU_K[.1],D_D.LEFT2,SI/7
U 1204, 0118,0038,0780,0800,0000,1205   ;1980           ALU_K[.1],D_D.LEFT2,SI/7
U 1205, 0118,0038,0780,0800,0000,1206   ;1981           ALU_K[.1],D_D.LEFT2,SI/7
U 1206, 0118,0038,0780,0800,0000,1207   ;1982           ALU_K[.1],D_D.LEFT2,SI/7
U 1207, 0118,0038,0780,0800,0000,1208   ;1983           ALU_K[.1],D_D.LEFT2,SI/7
U 1208, 0118,0038,0780,0800,0000,1209   ;1984           ALU_K[.1],D_D.LEFT2,SI/7
U 1209, 0100,003E,0380,0800,0000,0001   ;1985           D_D.LEFT2,SI/7,RETURN1
U 120A, 0018,0038,0980,0800,0000,120B   ;1986   DRAAAA: ALU_K[.2]
U 120B, 0218,0038,0B80,0800,0000,120C   ;1987           ALU_K[.2],D_D.RIGHT2,SI/7
U 120C, 0218,0038,0B80,0800,0000,120D   ;1988           ALU_K[.2],D_D.RIGHT2,SI/7
U 120D, 0218,0038,0B80,0800,0000,120E   ;1989           ALU_K[.2],D_D.RIGHT2,SI/7
U 120E, 0218,0038,0B80,0800,0000,120F   ;1990           ALU_K[.2],D_D.RIGHT2,SI/7
U 120F, 0218,0038,0B80,0800,0000,1210   ;1991           ALU_K[.2],D_D.RIGHT2,SI/7
U 1210, 0218,0038,0B80,0800,0000,1211   ;1992           ALU_K[.2],D_D.RIGHT2,SI/7
U 1211, 0218,0038,0B80,0800,0000,1212   ;1993           ALU_K[.2],D_D.RIGHT2,SI/7
U 1212, 0200,003E,0380,0800,0000,0001   ;1994           D_D.RIGHT2,SI/7,RETURN1
U 1213, 0F00,003C,0180,0800,0000,1214   ;1995   DC.NF:  D_0
U 1214, 0819,0000,0580,0800,0000,1010   ;1996           D_D-K[.1],J/DC0
                                        ;1997   ; THIS TABLE IS ISED AS A TARGET TO TEST  BRANCHES.
                                        ;1998   ; NOTE THAT IT RETURNS BY RETURN2 IF Q IS
                                        ;1999   ; ZERO AFTER EXECUTION, OR RETURNS BY RETURN1 IF Q IS NON ZERO.
                                        ;2000   =0000
U 1020, 0019,2000,05C0,0800,0000,1021   ;2001   BRTBLE: Q_Q-K[.1]
U 1021, 0019,2000,05C0,0800,0000,1022   ;2002           Q_Q-K[.1]
U 1022, 0019,2000,05C0,0800,0000,1023   ;2003           Q_Q-K[.1]
U 1023, 0019,2000,05C0,0800,0000,1024   ;2004           Q_Q-K[.1]
U 1024, 0019,2000,05C0,0800,0000,1025   ;2005           Q_Q-K[.1]
U 1025, 0019,2000,05C0,0800,0000,1026   ;2006           Q_Q-K[.1]
U 1026, 0019,2000,05C0,0800,0000,1027   ;2007           Q_Q-K[.1]
U 1027, 0019,2000,05C0,0800,0000,1028   ;2008           Q_Q-K[.1]
U 1028, 0019,2000,05C0,0800,0000,1029   ;2009   BRT1:   Q_Q-K[.1]
U 1029, 0019,2000,05C0,0800,0000,102A   ;2010           Q_Q-K[.1]
U 102A, 0019,2000,05C0,0800,0000,102B   ;2011           Q_Q-K[.1]
U 102B, 0019,2000,05C0,0800,0000,102C   ;2012           Q_Q-K[.1]
U 102C, 0019,2000,05C0,0800,0000,102D   ;2013   BRT2:   Q_Q-K[.1]
U 102D, 0019,2000,05C0,0800,0000,102E   ;2014           Q_Q-K[.1]
U 102E, 0019,2000,05C0,0800,0000,102F   ;2015           Q_Q-K[.1]
U 102F, 0001,203C,0180,0800,0010,1215   ;2016           ALU_Q,CLK.UBCC
U 1215, 001D,2114,01C0,0800,0000,1044   ;2017           Z?,ALU_Q+D,Q_ALU
U 1044, 0000,003E,0180,0800,0000,0001   ;2018   =0      RETURN1
U 1045, 0000,003E,0180,0800,0000,0002   ;2019           RETURN2
                                        ;2020   ; THESE SUBROUTINES ARE USED TO SHIFT ZEROES INTO THE Q REGISTER.
                                        ;2021   =0
U 1048, 0000,003D,0180,0800,0000,1216   ;2022   SHQLFT16:       CALL,J/SHQLFT8
U 1049, 0000,003C,0180,0800,0000,1216   ;2023           J/SHQLFT8
U 1216, 0000,003C,01A8,0800,0000,1217   ;2024   SHQLFT8:        Q_Q.LEFT,SI/3
U 1217, 0000,003C,01A8,0800,0000,1218   ;2025   SHQLFT7:        Q_Q.LEFT,SI/3
```

```
U 1218, 0000,003C,01A8,0800,0000,1219   ;2026           Q_Q.LEFT,SI/3
U 1219, 0000,003C,01A8,0800,0000,121A   ;2027           Q_Q.LEFT,SI/3
U 121A, 0000,003C,01A8,0800,0000,121B   ;2028           Q_Q.LEFT,SI/3
U 121B, 0000,003C,01A8,0800,0000,121C   ;2029           Q_Q.LEFT,SI/3
U 121C, 0000,003C,01A8,0800,0000,121D   ;2030           Q_Q.LEFT,SI/3
U 121D, 0000,003E,01A8,0800,0000,0001   ;2031           Q_Q.LEFT,SI/3,RETURN1
                                        ;2032   ; THESE SUBROUTINES ARE USED TO SHIFT 1'S INTO THE Q REGISTE.
                                        ;2033   =0
U 104A, 0000,003D,0180,0800,0000,121E   ;2034   SHQL16: CALL,J/SHQL8
U 104B, 0000,003C,0180,0800,0000,121E   ;2035           J/SHQL8
U 121E, 0000,003C,03A8,0800,0000,121F   ;2036   SHQL8:  Q_Q.LEFT,SI/7
U 121F, 0000,003C,03A8,0800,0000,1220   ;2037   SHQL7:  Q_Q.LEFT,SI/7
U 1220, 0000,003C,03A8,0800,0000,1221   ;2038           Q_Q.LEFT,SI/7
U 1221, 0000,003C,03A8,0800,0000,1222   ;2039           Q_Q.LEFT,SI/7
U 1222, 0000,003C,03A8,0800,0000,1223   ;2040           Q_Q.LEFT,SI/7
U 1223, 0000,003C,03A8,0800,0000,1224   ;2041           Q_Q.LEFT,SI/7
U 1224, 0000,003C,03A8,0800,0000,1225   ;2042           Q_Q.LEFT,SI/7
U 1225, 0000,003E,03A8,0800,0000,0001   ;2043           Q_Q.LEFT,SI/7,RETURN1
                                        ;2044   ; THESE TABLES ARE USED TO WRITE THE RA AND RB SCRATCH PADS.
                                        ;2045   =0000
U 1030, 0001,203E,0180,0A80,0000,0001   ;2046   WRRARB: R[0]_Q,RETURN1
U 1031, 0001,203E,0180,0A88,0000,0001   ;2047           R[1]_Q,RETURN1
U 1032, 0001,203E,0180,0A90,0000,0001   ;2048           R[2]_Q,RETURN1
U 1033, 0001,203E,0180,0A98,0000,0001   ;2049           R[3]_Q,RETURN1
U 1034, 0001,203E,0180,0AA0,0000,0001   ;2050           R[4]_Q,RETURN1
U 1035, 0001,203E,0180,0AA8,0000,0001   ;2051           R[5]_Q,RETURN1
U 1036, 0001,203E,0180,0AB0,0000,0001   ;2052           R[6]_Q,RETURN1
U 1037, 0001,203E,0180,0AB8,0000,0001   ;2053           R[7]_Q,RETURN1
U 1038, 0001,203E,0180,0AC0,0000,0001   ;2054           R[8]_Q,RETURN1
U 1039, 0001,203E,0180,0AC8,0000,0001   ;2055           R[9]_Q,RETURN1
U 103A, 0001,203E,0180,0AD0,0000,0001   ;2056           R[0A]_Q,RETURN1
U 103B, 0001,203E,0180,0AD8,0000,0001   ;2057           R[0B]_Q,RETURN1
U 103C, 0001,203E,0180,0AE0,0000,0001   ;2058           R[0C]_Q,RETURN1
U 103D, 0001,203E,0180,0AE8,0000,0001   ;2059           R[0D]_Q,RETURN1
U 103E, 0001,203E,0180,0AF0,0000,0001   ;2060           R[0E]_Q,RETURN1
U 103F, 0001,203E,0180,0AF8,0000,0001   ;2061           R[0F]_Q,RETURN1
                                        ;2062   ; THESE TABLES ARE USED TO WRITE Q INTO THE RC SCRATCH PADS.
                                        ;2063   =0000
U 1060, 0001,203E,0180,0980,0000,0001   ;2064   WRRC:   RC[0]_Q,RETURN1
U 1061, 0001,203E,0180,0988,0000,0001   ;2065           RC[1]_Q,RETURN1
U 1062, 0001,203E,0180,0990,0000,0001   ;2066           RC[2]_Q,RETURN1
U 1063, 0001,203E,0180,0998,0000,0001   ;2067           RC[3]_Q,RETURN1
U 1064, 0001,203E,0180,09A0,0000,0001   ;2068           RC[4]_Q,RETURN1
U 1065, 0001,203E,0180,09A8,0000,0001   ;2069           RC[5]_Q,RETURN1
U 1066, 0001,203E,0180,09B0,0000,0001   ;2070           RC[6]_Q,RETURN1
U 1067, 0001,203E,0180,09B8,0000,0001   ;2071           RC[7]_Q,RETURN1
U 1068, 0001,203E,0180,09C0,0000,0001   ;2072           RC[8]_Q,RETURN1
U 1069, 0001,203E,0180,09C8,0000,0001   ;2073           RC[9]_Q,RETURN1
U 106A, 0001,203E,0180,09D0,0000,0001   ;2074           RC[0A]_Q,RETURN1
U 106B, 0001,203E,0180,09D8,0000,0001   ;2075           RC[0B]_Q,RETURN1
U 106C, 0001,203E,0180,09E0,0000,0001   ;2076           RC[0C]_Q,RETURN1
U 106D, 0001,203E,0180,09E8,0000,0001   ;2077           RC[0D]_Q,RETURN1
U 106E, 0001,203E,0180,09F0,0000,0001   ;2078           RC[0E]_Q,RETURN1
U 106F, 0001,203E,0180,09F8,0000,0001   ;2079           RC[0F]_Q,RETURN1
                                        ;2080   ; THESE ARE USED TO READ THE RA AND RB SCRATCH PADS
```

```
                                         ;2081    ; INTO LA AND LB.
                                         ;2082    =0000
U 1070, 0000,003E,0180,0A00,0000,0001    ;2083    LTCHAB: LAB_R[0],RETURN1
U 1071, 0000,003E,0180,0A08,0000,0001    ;2084            LAB_R[1],RETURN1
U 1072, 0000,003E,0180,0A10,0000,0001    ;2085            LAB_R[2],RETURN1
U 1073, 0000,003E,0180,0A18,0000,0001    ;2086            LAB_R[3],RETURN1
U 1074, 0000,003E,0180,0A20,0000,0001    ;2087            LAB_R[4],RETURN1
U 1075, 0000,003E,0180,0A28,0000,0001    ;2088            LAB_R[5],RETURN1
U 1076, 0000,003E,0180,0A30,0000,0001    ;2089            LAB_R[6],RETURN1
U 1077, 0000,003E,0180,0A38,0000,0001    ;2090            LAB_R[7],RETURN1
U 1078, 0000,003E,0180,0A40,0000,0001    ;2091            LAB_R[8],RETURN1
U 1079, 0000,003E,0180,0A48,0000,0001    ;2092            LAB_R[9],RETURN1
U 107A, 0000,003E,0180,0A50,0000,0001    ;2093            LAB_R[0A],RETURN1
U 107B, 0000,003E,0180,0A58,0000,0001    ;2094            LAB_R[0B],RETURN1
U 107C, 0000,003E,0180,0A60,0000,0001    ;2095            LAB_R[0C],RETURN1
U 107D, 0000,003E,0180,0A68,0000,0001    ;2096            LAB_R[0D],RETURN1
U 107E, 0000,003E,0180,0A70,0000,0001    ;2097            LAB_R[0E],RETURN1
U 107F, 0000,003E,0180,0A78,0000,0001    ;2098            LAB_R[0F],RETURN1
                                         ;2099    ; THESE ARE USED TO READ THE RC SCRATCH PADS INTO LC.
                                         ;2100    =0000
U 1080, 0000,003E,0180,0900,0000,0001    ;2101    LTCHRC: LC_RC[0],RETURN1
U 1081, 0000,003E,0180,0908,0000,0001    ;2102            LC_RC[1],RETURN1
U 1082, 0000,003E,0180,0910,0000,0001    ;2103            LC_RC[2],RETURN1
U 1083, 0000,003E,0180,0918,0000,0001    ;2104            LC_RC[3],RETURN1
U 1084, 0000,003E,0180,0920,0000,0001    ;2105            LC_RC[4],RETURN1
U 1085, 0000,003E,0180,0928,0000,0001    ;2106            LC_RC[5],RETURN1
U 1086, 0000,003E,0180,0930,0000,0001    ;2107            LC_RC[6],RETURN1
U 1087, 0000,003E,0180,0938,0000,0001    ;2108            LC_RC[7],RETURN1
U 1088, 0000,003E,0180,0940,0000,0001    ;2109            LC_RC[8],RETURN1
U 1089, 0000,003E,0180,0948,0000,0001    ;2110            LC_RC[9],RETURN1
U 108A, 0000,003E,0180,0950,0000,0001    ;2111            LC_RC[0A],RETURN1
U 108B, 0000,003E,0180,0958,0000,0001    ;2112            LC_RC[0B],RETURN1
U 108C, 0000,003E,0180,0960,0000,0001    ;2113            LC_RC[0C],RETURN1
U 108D, 0000,003E,0180,0968,0000,0001    ;2114            LC_RC[0D],RETURN1
U 108E, 0000,003E,0180,0970,0000,0001    ;2115            LC_RC[0E],RETURN1
U 108F, 0000,003E,0180,0978,0000,0001    ;2116            LC_RC[0F],RETURN1
                                         ;2117    ; THIS ROUTINE IS USED TO FILL ALL RA AND RB WITH THE
                                         ;2118    ; CONTENTS OF Q.
                                         ;2119    =0
U 1050, 0F00,003D,0180,0800,0000,1213    ;2120    RARB.Q: D_0,CALL,J/DC.NF
U 1051, 0000,003C,0180,0800,0000,1052    ;2121            NOP
                                         ;2122    =0
U 1052, 0000,193D,0180,0800,0000,1030    ;2123    RARB.QA:        CALL,D3-0?,J/WRRARB
U 1053, 0819,0014,0580,0800,0010,1226    ;2124            D_D+K[.1],CLK.UBCC
U 1226, 0000,013C,0180,0800,0000,1058    ;2125            Z?
U 1058, 0000,003C,0180,0800,0000,1052    ;2126    =0      J/RARB.QA
U 1059, 0000,003E,0180,0800,0000,0001    ;2127            RETURN1
                                         ;2128    ; THIS ROUTINE IS USED TO FILL ALL RC WITH THE
                                         ;2129    ; CONTENTS OF Q.
                                         ;2130    =0
U 105C, 0F00,003D,0180,0800,0000,1213    ;2131    RC.Q:   D_0,CALL,J/DC.NF
U 105D, 0000,003C,0180,0800,0000,1098    ;2132            NOP
                                         ;2133    =0
U 1098, 0000,193D,0180,0800,0000,1060    ;2134    RC.QA:  CALL,D3-0?,J/WRRC
U 1099, 0819,0014,0580,0800,0010,1227    ;2135            D_D+K[.1],CLK.UBCC
```

```
U 1227, 0000,013C,0180,0800,0000,109A   ;2136            Z?
U 109A, 0000,003C,0180,0800,0000,1098   ;2137   =0       J/RC.QA
U 109B, 0000,003E,0180,0800,0000,0001   ;2138            RETURN1
```

```
                                                       .PAGE   "TEST 5E        SC AND KMX/SC TEST"
                                                 ;*******************************************************
                                                 ;++
                                                 ; TEST  5E      SC AND KMX/SC TEST
                                                 ;
                                                 ; TEST DESCRIPTION
                                                 ;      THIS IS A TEST OF THE SMX/ALU INPUTS, THE SC REGISTER AND
                                                 ;      THE SC INPUTS TO THE KMX.
                                                 ;      THE DATA PATTERNS USED ARE GENERATED BY FLOATING A
                                                 ;      1 THROUGH 0'S AND A 0 THROUGH 1'S.
                                                 ;
                                                 ; LOGIC DESCRIPTION
                                                 ;      THE SC REGIATER <09:00> IS ON THE DDP MODULE.
                                                 ;      THE KMX/SC BIT<9:8> ARE ON DDP, BITS <07:00> ARE ON DCP.
                                                 ;      THE CONTROL SIGNALS FOR THE SMX AND SC REGISTER ARE GENERATED ON DDP.
                                                 ;      THE KMX SELECT SIGNALS ARE GENERATED ON DCP.
                                                 ;
                                                 ; ERROR DESCRIPTION
                                                 ;      EXPECTED DATA
                                                 ;      GOT DATA
                                                 ;
                                                 ;--
                                                 ;*******************************************************
                                                 =0
U 109C, 0000,003D,0180,0800,0000,10B2            SCTST:  NEWTST
U 109D, 0018,0038,0980,09F8,0000,1228                    RC[0F]_K[.2]
U 1228, 0F00,003C,0180,0800,0000,10A8                    D_0                     ; GENERATE A MASK FOR
U 10A8, 0000,003D,0180,0800,0000,101F            =0      CALL,J/DCF              ; CALCULATING THE EXPECTED RESULT.
U 10A9, 0018,0038,C180,0800,0000,1229                    ALU_K[.FFFF]
U 1229, 0100,003C,0380,0800,0000,10AC                    D_D.LEFT2,SI/7
U 10AC, 0000,003D,0180,0800,0000,101F            =0      CALL,J/DCF
U 10AD, 0001,003C,0180,0AA0,0000,10B0                    R[4]_D                  ; R[4]=000003FF
U 10B0, 0F00,003D,0180,0800,0000,101B            =0      D_0,CALL,J/DCB
U 10B1, 0001,003C,0180,0AA8,0000,122A                    R[5]_D                  ; SET UP A COUNTER, R[5]=B
U 122A, 0F00,003C,0180,0800,0000,122B                    D_0                     ; SET UP THE INITIAL DATA PATTERN
U 122B, 0018,0038,C180,0800,0000,122C                    ALU_K[.FFFF]
U 122C, 0500,003C,0380,0800,0000,122D                    D_D.LEFT,SI/7
U 122D, 0001,003C,0180,0A98,0000,10B4                    R[3]_D                  ; R[3]=1
U 10B4, 0000,003D,0180,0800,0000,111C            =0      ERLOOP
U 10B5, 0800,003C,0180,0A18,0000,122E            SCA:    D_R[3]                  ; SET UP THE OPERAND
U 122E, 0001,003C,0180,0A88,0082,122F                    ALU_D,SMX/ALU,SCK/LOAD,R[1]_ALU ; LOAD SC
U 122F, 0000,003C,C180,0800,0004,7230                    KMX7.FFFF,EBMX/KMX,EALU/B,SMX/EALU ; THIS INSTRUCTION
                                                                                 ; INSURES THAT THE SC IS NOT
                                                                                 ; CLOCKED WHEN IT SHOULDN'T
                                                                                 ; BE CLOCKED. IT SHOULD
                                                                                 ; HAVE NO EFFECT.
U 1230, 0018,0038,1DC0,09E8,0000,1231                    KMX/SC,BMX/KMX,ALU/B,Q_ALU,RC[0D]_ALU ; READ THE SC.
U 1231, 081C,2034,0180,0A20,0000,1232                    LAB_R[4],ALU_LA[AND]D,D_ALU ; CALCULATE EXPECTED RESULT.
U 1232, 0001,003C,0180,09F0,0000,1233                    RC[0E]_D
U 1233, 001D,2000,0180,0800,0010,1234                    ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1234, 0000,013C,0180,0800,0000,10B8                    Z?
U 10B8, 0000,003D,0180,0800,0000,111E            =0      ERROR1                  ; REPORT THE ERROR.
U 10B9, 0800,0028,0180,0A18,0000,1235                    LAB_R[3],ALU_NOT.LA,D_ALU ; GENERATE THE COMPLEMENT
                                                                                 ; DATA PATTERN.
U 1235, 0001,003C,0180,0800,0082,1236                    ALU_D,SMX/ALU,SCK/LOAD  ; LOAD IT INTO THE SC.
```

```
U 1236, 0000,003C,1980,0800,0004,7237   ;2194           KMX/ZERO,EBMX/KMX,EALU/B,SMX/EALU ; THIS INSTRUCTION SHOULD HAVE
                                        ;2195                                             ; NO EFFECT.
U 1237, 0018,0038,1DC0,09E8,0000,1238   ;2196           KMX/SC,BMX/KMX,ALU/B,Q_ALU,RC[0D]_ALU ; READ THE SC
U 1238, 081C,2034,0180,0A20,0000,1239   ;2197           LAB_R[4],ALU_LA[AND]D,D_ALU ; CALCULATE THE EXPECTED RESULT.
U 1239, 0001,003C,0180,09F0,0000,123A   ;2198           RC[0E]_D
U 123A, 001D,2000,0180,0800,0010,123B   ;2199           ALU_Q-D,CLK.UBCC            ; CHECK THE RESULT.
U 123B, 0000,013C,0180,0800,0000,10BA   ;2200           Z?
U 10BA, 0000,003D,0180,0800,0000,111E   ;2201   =0      ERROR1                      ; REPORT THE ERROR.
U 10BB, 0000,003C,0180,0A18,0000,123C   ;2202           LAB_R[3]                    ; GENERATE NEXT PATTERN
U 123C, 0060,403C,0180,0A98,0000,123D   ;2203           ALU_LA,SHF/ALU.DT,DT/WORD,R[3]_SHF
U 123D, 0000,003C,0180,0A28,0000,123E   ;2204           LAB_R[5]                    ; TRIED ALL PATTERNS?
U 123E, 0018,0000,0580,0AA8,0010,123F   ;2205           R[5]_LA-K[.1],CLK.UBCC
U 123F, 0000,013C,0180,0800,0000,10C0   ;2206           Z?
U 10C0, 0000,003C,0180,0800,0000,10B5   ;2207   =0      J/SCA                       ; IF NOT CONTINUE TEST.
U 10C1, 0000,003C,0180,0800,0000,10C2   ;2208           NOP                         ; ELSE DONE.
```

```
                                        ;2209           .PAGE   "TEST 5F        SC BEN TEST A"
                                        ;2210   ;*************************************************************
                                        ;2211   ;++
                                        ;2212   ; TEST  5F      SC BEN TEST A
                                        ;2213   ;
                                        ;2214   ; TEST DESCRIPTION
                                        ;2215   ;       THIS IS A TEST OF:
                                        ;2216   ;               BEN/0C  BIT 2
                                        ;2217   ;               BEN/12  BIT 1
                                        ;2218   ;               BEN/14  BIT 2
                                        ;2219   ;               BEN/14  BIT 1
                                        ;2220   ;               BEN/14  BIT 0
                                        ;2221   ;       WITH THE SC=0.
                                        ;2222   ;
                                        ;2223   ; LOGIC DESCRITION
                                        ;2224   ;
                                        ;2225   ; ERROR DESCRIPTION:
                                        ;2226   ;       ERROR CODE:
                                        ;2227   ;               0 - BEN/0C BIT 2 FAILED
                                        ;2228   ;               1 - BEN/12 BIT 1 FAILED
                                        ;2229   ;               2 - BEN/14 BIT 2 FAILED
                                        ;2230   ;               3 - BEN/14 BIT 1 FAILED
                                        ;2231   ;               4 - BEN/14 BIT 0 FAILED
                                        ;2232   ;
                                        ;2233   ;--
                                        ;2234   ;*************************************************************
                                        ;2235   =0
U 10C2, 0000,003D,0180,0800,0000,10B2   ;2236   SCB:    NEWTST
U 10C3, 0018,0038,0580,09F8,0000,10C8   ;2237           RC[0F]_K[.1]
U 10C8, 0000,003D,0180,0800,0000,111C   ;2238   =0      ERLOOP
U 10C9, 0018,0038,1980,0800,0082,1240   ;2239           ALU_0(K),SC_ALU         ; SET UP SC=0.
U 1240, 0000,0C3C,0180,0800,0000,1003   ;2240           BEN7MUL                 ; BEN SC.NE.0
U 1003, 0000,003C,0180,0800,0000,1241   ;2241   =011    J/SCB1
U 1007, 0003,003D,0180,09F0,0000,111E   ;2242           ERROR1,RC[0E]_0         ; REPORT FAILURE
U 1241, 0000,123C,0180,0800,0000,100D   ;2243   SCB1:   BEN/EALU                ; BEN/SC.NE.0
U 100D, 0000,003C,0180,0800,0000,1242   ;2244   =1101   J/SCB15
U 100F, 0018,0039,0580,09F0,0000,111E   ;2245           ERROR1,RC[0E]_K[.1]
U 1242, 0000,143C,0180,0800,0000,1043   ;2246   SCB15:  SC?                     ; BEN SC<9:8>.NE.0
U 1043, 0000,003C,0180,0800,0000,1243   ;2247   =011    J/SCB2
U 1047, 0018,0039,0980,09F0,0000,111E   ;2248           ERROR1,RC[0E]_K[.2]
U 1243, 0000,143C,0180,0800,0000,1055   ;2249   SCB2:   SC?                     ; BEN SC.GT.0
U 1055, 0000,003C,0180,0800,0000,1244   ;2250   =101    J/SCB3
U 1057, 0018,0039,0D80,09F0,0000,111E   ;2251           ERROR1,RC[0E]_K[.3]
U 1244, 0000,143C,0180,0800,0000,109E   ;2252   SCB3:   SC?                     ; BEN SC<9:5>.NE.0
U 109E, 0000,003C,0180,0800,0000,1245   ;2253   =110    J/SCB4
U 109F, 0018,0039,1180,09F0,0000,111E   ;2254           ERROR1,RC[0E]_K[.4]
U 1245, 0000,003C,0180,0800,0000,10CA   ;2255   SCB4:   NOP
```

```
                                                        .PAGE   "TEST 60        SC BEN TEST B"
                                                ;*****************************************************************
                                                ;++
                                                ; TEST  60      SC BEN TEST B
                                                ;
                                                ; TEST DESCRIPTION
                                                ;       THIS IS A TEST OF BEN/SC.NE.0
                                                ;               BEN OC  BIT 2
                                                ;               BEN 12  BIT 1
                                                ;       WITH SC NOT ZERO. A 1 IS FLOATED
                                                ;       ACROSS 0'S IN THE SC.
                                                ;
                                                ; LOGIC DESCRIPTION
                                                ;
                                                ; ERROR DESCRIPTION
                                                ;       DATA PATTERN IN SC
                                                ;       ERROR CODE:
                                                ;               1 - BEN OC BIT 2 FAILED (BEN/MUL)
                                                ;               0 - BEN 12 BIT 1 FAILED (BEN EALU)
                                                ;
                                                ;--
                                                ;*****************************************************************
                                                =0
U 10CA, 0000,003D,0180,0800,0000,10B2           SCC:    NEWTST
U 10CB, 0018,0038,F580,0AA8,0000,1246                   R[5]_K[.A]                ; SET UP A COUNTER
U 1246, 0018,0038,0580,0AC8,0000,1247                   R[9]_K[.1]                ; INITIALIZE THE DATA PATTERN
U 1247, 0018,0038,0580,09F8,0000,10CC                   RC[0F]_K[.1]
U 10CC, 0000,003D,0180,0800,0000,111C           =0      ERLOOP
U 10CD, 0800,003C,0180,0A48,0082,1248           SCC1:   SC_R[9],D_R[9]            ; SET UP SC.
U 1248, 0003,123C,0180,09E8,0000,104D                   BEN/EALU,RC[0D]_0         ; TEST INSTRUCTION
U 104D, 0001,003D,0180,09F0,0000,111E           =1101   RC[0E]_D,ERROR1
U 104F, 0018,0038,0580,09E8,0000,1249                   RC[0D]_K[.1]
U 1249, 0000,0C3C,0180,0A28,0000,105B                   LAB_R[5],BEN/MUL          ; BEN SC.NE.0
U 105B, 0001,003D,0180,09F0,0000,111E           =011    RC[0E]_D,ERROR1
U 105F, 0018,0000,0580,0AA8,0010,124A                   R[5]_LA-K[.1],CLK.UBCC    ; FINISHED TEST?
U 124A, 0000,013C,0180,0A48,0000,10D0                   Z?,LAB_R[9]
U 10D0, 000C,0014,0180,0AC8,0000,10CD           =0      ALU_LA[A+B]LB,R[9]_ALU,J/SCC1 ; IF NOT GENERATE NEXT PATTERN
                                                                                  ; AND CONTINUE TEST
U 10D1, 0000,003C,0180,0800,0000,10D2                   NOP
```

```
                                        ;2295           .PAGE   "TEST 61        SC BEN TEST C"
                                        ;2296   ;*************************************************************
                                        ;2297   ;++
                                        ;2298   ; TEST  61      SC BEN TEST C
                                        ;2299   ;
                                        ;2300   ; TEST DESCRIPTION
                                        ;2301   ;       THIS IS A TEST OF BEN/14 USING DATA PATTERNS
                                        ;2302   ;       GENERATED BY FLOATING A 1 THROUGH A FIELD
                                        ;2303   ;       OF ZO'S.
                                        ;2304   ;
                                        ;2305   ; LOGIC DESCRIPTION
                                        ;2306   ;
                                        ;2307   ; ERROR DESCRIPTION
                                        ;2308   ;       DATA PATTERN IN SC
                                        ;2309   ;       ERROR CODE:
                                        ;2310   ;               0 - SC<9:8>.NE.0 FAILED TO BE DEASSERTED
                                        ;2311   ;               1 - SC<9:8>.NE.0 FAILED TO BE ASSERTED
                                        ;2312   ;               2 - SC.GT.0 FAILED TO BE DEASSERTED
                                        ;2313   ;               3 - SC.GT.0 FAILED TO BE ASSERTED
                                        ;2314   ;               4 - SC<9:5>.NE.0 FAILED TO BE DEASSERTED
                                        ;2315   ;               5 - SC<9:5>.NE.0 FAILED TO BE ASSERTED
                                        ;2316   ;
                                        ;2317   ;--
                                        ;2318   ;*************************************************************
                                        ;2319   =0
U 10D2, 0000,003D,0180,0800,0000,10B2   ;2320   SCD:    NEWTST
U 10D3, 0018,0038,0580,09F8,0000,124B   ;2321           RC[OF]_K[.1]
U 124B, 0F00,003C,0180,0800,0000,10D4   ;2322           D_0                     ; GENERATE CONSTANTS
U 10D4, 0000,003D,0180,0800,0000,101C   ;2323   =0      CALL,J/DCC              ; NEEDED TO ESTABLISH
U 10D5, 0100,003C,0180,0800,0000,10D8   ;2324           D_D.LEFT2,SI/ZERO       ; WHAT RESULT A PATTERN WILL
U 10D8, 0000,003D,0180,0800,0000,1010   ;2325   =0      CALL,J/DC0              ; HAVE ON THE BEN.
U 10D9, 0001,003C,0180,0AC0,0000,10DA   ;2326           R[8]_D                  ; R8=300 (HEX)
U 10DA, 0F00,003D,0180,0800,0000,1018   ;2327   =0      D_0,CALL,J/DC8
U 10DB, 0100,003C,0180,0800,0000,10E0   ;2328           D_D.LEFT2,SI/ZERO
U 10E0, 0000,003D,0180,0800,0000,1010   ;2329   =0      CALL,J/DC0
U 10E1, 0001,003C,0180,0AC8,0000,10E2   ;2330           R[9]_D                  ; R9=200 (HEX)
U 10E2, 0F00,003D,0180,0800,0000,101F   ;2331   =0      D_0,CALL,J/DCF
U 10E3, 0018,0038,C180,0800,0000,124C   ;2332           ALU_K[.FFFF]
U 124C, 0500,003C,0380,0800,0000,10E8   ;2333           D_D.LEFT,SI/7
U 10E8, 0500,003D,0180,0800,0000,1010   ;2334   =0      D_D.LEFT,SI/ZERO,CALL,J/DC0
U 10E9, 0001,003C,0180,0AD0,0000,10EA   ;2335           R[0A]_D                 ; RA=3F0 (HEX)
U 10EA, 0F00,003D,0180,0800,0000,101A   ;2336   =0      D_0,CALL,J/DCA          ; GENERATE A COUNTER
U 10EB, 0001,003C,0180,0AA8,0000,124D   ;2337           R[5]_D                  ; R[5]=0A
U 124D, 0018,0038,0580,0AA0,0000,10F0   ;2338           R[4]_K[.1]              : INITIALIZE THE DATA
U 10F0, 0000,003D,0180,0800,0000,111C   ;2339   =0      ERLOOP
U 10F1, 0800,003C,0180,0A20,0000,124E   ;2340   SCD1:   D_R[4]
U 124E, 0001,003C,0180,0A40,0082,124F   ;2341           ALU_D,SC_ALU,LAB_R[8]   ; SET UP THE SC
U 124F, 001C,2034,0180,0800,0010,1250   ;2342           ALU_LA[AND]D,CLK.UBCC   ; TEST SC<9:8>
U 1250, 0000,013C,0180,0800,0000,10F2   ;2343           Z?
U 10F2, 0018,1438,0580,09E8,0000,10B3   ;2344   =0      SC?,J/SCD3,RC[OD]_K[.1] ; TEST INSTRUCTIONS
U 10F3, 0003,143C,0180,09E8,0000,10AB   ;2345           SC?,RC[OD]_0
U 10AB, 0000,003C,0180,0800,0000,1251   ;2346   =011    J/SCD4
U 10AF, 0001,003D,0180,09F0,0000,111E   ;2347           RC[OE]_D,ERROR1
                                        ;2348   =011
U 10B3, 0001,003D,0180,09F0,0000,111E   ;2349   SCD3:   RC[OE]_D,ERROR1
```

```
U 10B7, 0000,003C,0180,0800,0000,1251   ;2350              NOP
U 1251, 0000,003C,0180,0A48,0000,1252   ;2351   SCD4:      LAB_R[9]
U 1252, 001C,2034,0180,0800,0010,1253   ;2352              ALU_LA[AND]D,CLK.UBCC   ; TEST SC.GT.0
U 1253, 0000,013C,0180,0800,0000,10F8   ;2353              Z?
U 10F8, 0018,1438,0D80,09E8,0000,10BD   ;2354   =0         SC?,J/SCD5,RC[0D]_K[.3] ; TEST INSTRUCTION
U 10F9, 0018,1438,0980,09E8,0000,10C5   ;2355              SC?,J/SCD6,RC[0D]_K[.2]
                                        ;2356   =101
U 10BD, 0000,003C,0180,0800,0000,1254   ;2357   SCD5:      J/SCD7
U 10BF, 0001,003D,0180,09F0,0000,111E   ;2358              RC[0E]_D,ERROR1
                                        ;2359   =101
U 10C5, 0001,003D,0180,09F0,0000,111E   ;2360   SCD6:      RC[0E]_D,ERROR1
U 10C7, 0000,003C,0180,0800,0000,1254   ;2361              NOP
U 1254, 0000,003C,0180,0A50,0000,1255   ;2362   SCD7:      LAB_R[0A]
U 1255, 001C,2034,0180,0800,0010,1256   ;2363              ALU_LA[AND]D,CLK.UBCC   ; TEST SC<9:5>
U 1256, 0000,013C,0180,0800,0000,10FA   ;2364              Z?
U 10FA, 001B,1410,1180,09E8,0000,10D6   ;2365   =0         SC?,J/SCD10,RC[0D]_ALU,ALU_0+K[.4]+1
U 10FB, 0018,1438,1180,09E8,0000,10CE   ;2366              SC?,RC[0D]_K[.4]
U 10CE, 0000,003C,0180,0800,0000,10D7   ;2367   =110       J/SCD11
U 10CF, 0001,003D,0180,09F0,0000,111E   ;2368              RC[0E]_D,ERROR1
                                        ;2369   =110
U 10D6, 0001,003D,0180,09F0,0000,111E   ;2370   SCD10:     RC[0E]_D,ERROR1
U 10D7, 0000,003C,0180,0A28,0000,1257   ;2371   SCD11:     LAB_R[5]
U 1257, 0018,0000,0580,0AA8,0010,1258   ;2372              R[5]_LA-K[.1],CLK.UBCC  ; USED ALL PATTERNS?
U 1258, 0000,013C,0180,0A20,0000,110A   ;2373              Z?,LAB_R[4]             ; IF NOT THEN GENERATE
U 110A, 000C,0014,0180,0AA0,0000,10F1   ;2374   =0         ALU_LA[A+B]LB,R[4]_ALU,J/SCD1 ; NEXT PATTERN AND CONTINUE.
U 110B, 0000,003C,0180,0800,0000,1110   ;2375              NOP
```

```
                                          ;2376          .PAGE   "TEST 62        MASK TEST"
                                          ;2377   ;**************************************************************
                                          ;2378   ;++
                                          ;2379   ; TEST  62      MASK TEST
                                          ;2380   ;
                                          ;2381   ; TEST DESCRIPTION
                                          ;2382   ;      A COUNT PATTERN IS RUN THROUGH SC<4:0> AND THE
                                          ;2383   ;      RESULTANT MASK IS READ THROUGH THE BMX AND CHECKED FOR EACH
                                          ;2384   ;      SC PATTERN.
                                          ;2385   ;
                                          ;2386   ; LOGIC DESCRIPTION
                                          ;2387   ;
                                          ;2388   ; ERROR DESCRIPTION
                                          ;2389   ;      EXPECTED MASK
                                          ;2390   ;      GOT MASK
                                          ;2391   ;
                                          ;2392   ;--
                                          ;2393   ;**************************************************************
                                          ;2394   =0
U 1110, 0000,003D,0180,0800,0000,10B2     ;2395   MSKST:  NEWTST
U 1111, 0018,0038,0980,09F8,0000,1259     ;2396           RC[0F]_K[.2]
U 1259, 0F18,0038,C180,0800,0000,1112     ;2397           D_0,ALU_K[.FFFF]        ; SET UP A COUNTER.
U 1112, 0500,003D,0380,0800,0000,101F     ;2398   =0      D_D.LEFT,SI/7,CALL,J/DCF
U 1113, 0001,003C,01F8,0AA8,0000,125A     ;2399           R[5]_D,Q_0
U 125A, 0000,003C,03B0,0800,0000,1118     ;2400           Q_Q.RIGHT,SI/7
U 1118, 0000,003D,0180,0800,0000,111C     ;2401   =0      ERLOOP
U 1119, 0000,003C,0180,0A28,0082,125B     ;2402   MSK1:   SC_R[5]                 ; SET UP SC
U 125B, 0001,2028,0180,09F0,0000,125C     ;2403           ALU_NOT.Q,RC[0E]_ALU    ; COMPUTE EXPECTED RESULT.
                                          ;2404   ; TEST INSTRUCTION:
U 125C, 0001,2010,0180,0800,0010,125D     ;2405           BMX/MASK,RAMX/Q,AMX/RAMX,ALU/A+B+1,CLK.UBCC
U 125D, 0000,013C,0180,0800,0000,111A     ;2406           Z?
U 111A, 0000,0039,0180,09E8,0000,111E     ;2407   =0      BMX/MASK,ALU/B,RC[0D]_ALU,ERROR1
U 111B, 0000,003C,0180,0A28,0010,125E     ;2408           Q_Q.RIGHT,SI/ZERO,ALU_R[5],CLK.UBCC     ; FINISHED TEST?
U 125E, 0000,013C,0180,0800,0000,1120     ;2409           Z?
U 1120, 0018,0000,0580,0AA8,0000,1119     ;2410   =0      R[5]_LA-K[.1],J/MSK1    ; IF NOT CONTINUE WITH NEXT PATTERN
U 1121, 0000,003C,0180,0800,0000,1122     ;2411           NOP
```

```
                                          ;2412           .PAGE   "TEST 63        SMX/ALU.EXP TEST"
                                          ;2413   ;*********************************************************
                                          ;2414   ;++
                                          ;2415   ; TEST  63      SMX/ALU/EXP TEST
                                          ;2416   ;
                                          ;2417   ; TEST DESCRIPTION
                                          ;2418   ;       THIS IS A TEST OF THE SMX/ALU.EXP INPUTS. THE EXPONENT
                                          ;2419   ;       IS IN BIT POSITION <14:07>. A ONE IS FLOATED ACROSS
                                          ;2420   ;       0'S AND A 0 IS FLOATED ACROSS 1'S TO GENERATE
                                          ;2421   ;       THE TEST PATTERNS USED HERE.
                                          ;2422   ;
                                          ;2423   ; LOGIC DESCRIPTION
                                          ;2424   ;
                                          ;2425   ; ERROR DESCRIPTION
                                          ;2426   ;       EXPECTED DATA
                                          ;2427   ;       GOT DATA
                                          ;2428   ;
                                          ;2429   ;--
                                          ;2430   ;***************************************** *****************
                                          ;2431   =0
U 1122, 0000,003D,0180,0800,0000,10B2     ;2432   SMXP:   NEWTST
U 1123, 0018,0038,0980,09F8,0000,1124     ;2433           RC[OF]_K[.2]
U 1124, 0818,0039,0180,0AA8,0000,1010     ;2434   =0      D_K[.8],R[5]_K[.8],CALL,J/DC0 ; SET UP A COUNTER
U 1125, 0001,003C,0180,0A98,0000,125F     ;2435           R[3]_D                  ; AND THE INITIAL DATA PATTERN
U 125F, 0018,0038,0580,0AA0,0000,1260     ;2436           R[4]_K[.1]
U 1260, 0018,0038,4980,0AB0,0000,1126     ;2437           R[6]_K[.FF]
U 1126, 0000,003D,0180,0800,0000,111C     ;2438   =0      ERLOOP
U 1127, 0000,003C,0180,0A18,0083,1261     ;2439   SMXP1:  ALU_R[3],SC_ALU(EXP)    ; TEST INSTRUCTION
U 1261, 0000,003C,01C0,0A20,0000,1262     ;2440           Q_R[4]                  ; COMPUTE EXPECTED DATA.
U 1262, 001C,0034,01C0,0A30,0000,1263     ;2441           LAB_R[6],ALU_LA[AND]Q,Q_ALU
U 1263, 0001,203C,0180,09F0,0000,1264     ;2442           RC[OE]_Q
U 1264, 0818,0038,1D80,09E8,0000,1265     ;2443           D_SC,RC[OD]_ALU         ; GET THE ACTUAL RESULT.
U 1265, 001D,2000,0180,0800,0010,1266     ;2444           ALU_Q-D,CLK.UBCC        ; IS IT CORRECT?
U 1266, 0000,013C,0180,0800,0000,1128     ;2445           Z?
U 1128, 0000,003D,0180,0800,0000,111E     ;2446   =0      ERROR1
U 1129, 0000,0028,0180,0A18,0083,1267     ;2447           LAB_R[3],AMX/LA,ALU/NOTA,SC_ALU(EXP) ; NOW TEST
U 1267, 0000,003C,01C0,0A20,0000,1268     ;2448           Q_R[4]                  ; THE COMPLEMENT DATA PATTERN
U 1268, 001C,0024,01C0,0A30,0000,1269     ;2449           LAB_R[6],ALU_LA[ANDNOT]Q,Q_ALU
U 1269, 0001,203C,0180,09F0,0000,126A     ;2450           RC[OE]_Q
U 126A, 0818,0038,1D80,09E8,0000,126B     ;2451           D_SC,RC[OD]_ALU         ; GET THE RESULT.
U 126B, 001D,2000,0180,0800,0010,126C     ;2452           ALU_Q-D,CLK.UBCC        ; IS IT CORRECT?
U 126C, 0000,013C,0180,0800,0000,112A     ;2453           Z?
U 112A, 0000,003D,0180,0800,0000,111E     ;2454   =0      ERROR1
U 112B, 0000,003C,0180,0A28,0000,126D     ;2455           LAB_R[5]
U 126D, 0018,0000,0580,0AA8,0010,126E     ;2456           R[5]_LA-K[.1],CLK.UBCC  ; TESTING COMPLETE?
U 126E, 0000,013C,0180,0800,0000,112C     ;2457           Z?
U 112C, 0000,003C,0180,0A20,0000,126F     ;2458   =0      LAB_R[4],J/SMXP2        ; IF NOT SHIFT DATA PATTERN
U 112D, 0000,003C,0180,0800,0000,1272     ;2459           J/SMXP3
U 126F, 0020,003C,0100,0AA0,0000,1270     ;2460   SMXP2:  AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4]_SHF
U 1270, 0000,003C,0180,0A18,0000,1271     ;2461           LAB_R[3]
U 1271, 0020,003C,0100,0A98,0000,1127     ;2462           ALU_LA,SHF/LEFT,SI/2,R[3]_SHF,J/SMXP1
U 1272, 0000,003C,0180,0800,0000,112E     ;2463   SMXP3:  NOP
```

```
                                              ;2464           .PAGE   "TEST 64        DAL SHIFTER TEST"
                                              ;2465   ;*************************************************************
                                              ;2466   ;++
                                              ;2467   ; TEST  64      DAL SHIFTER TEST
                                              ;2468   ;
                                              ;2469   ; TEST DESCRIPTION
                                              ;2470   ;       THIS IS A TEST OF THE DAL SHIFTER CIRCUIT. ALL THE
                                              ;2471   ;       DATA PATTERNS GENERATED BY SHIFTING A 1 THROUGH A FIELD
                                              ;2472   ;       OF 0'S AND A 0 THROUGH A FIELD OF 1'S IS TRIED WITH EVERY
                                              ;2473   ;       SHIFT COUNT POSSIBLE.
                                              ;2474   ;
                                              ;2475   ; LOGIC DESCRIPTION
                                              ;2476   ;
                                              ;2477   ; ERROR DESCRIPTION
                                              ;2478   ;       EXPECTED D REGISTER RESULT
                                              ;2479   ;       GOT RESULT
                                              ;2480   ;       D REGISTER OPERAND
                                              ;2481   ;       Q REGISTER OPERAND
                                              ;2482   ;       SC VALUE USED IN SHIFT
                                              ;2483   ;
                                              ;2484   ;--
                                              ;2485   ;*************************************************************
                                              ;2486   =0
U 112E, 0000,003D,0180,0800,0000,10B2         ;2487   DAL:    NEWTST
U 112F, 0018,0038,5580,0AC0,0000,1273         ;2488           R[8]_K[.3F]                     ; SET UP A COUNTER
U 1273, 0018,0038,8D80,0AD0,0000,1274         ;2489           R[0A]_K[.1F]                    ; INITIALIZE THE SHIFT COUNT
U 1274, 0F00,003C,0180,0800,0000,1275         ;2490   DAL1:   D_0
U 1275, 0000,003C,01F8,0800,0000,1276         ;2491           Q_0
U 1276, 0000,003C,03A8,0800,0000,1277         ;2492           Q_Q.LEFT,SI/7
U 1277, 0001,003C,0180,0A98,0000,1278         ;2493           R[3]_D
U 1278, 0001,203C,0180,0AA0,0000,1130         ;2494           R[4]_Q
U 1130, 0000,003D,0180,0800,0000,12B0         ;2495   =0      CALL,J/DALSUT                   ; SET UP FOR TEST OF THIS SC.
U 1131, 0001,003C,0180,0AA8,0000,1279         ;2496           R[5]_D
U 1279, 0001,203C,0180,0AB0,0000,1132         ;2497           R[6]_Q
U 1132, 0F00,003D,0180,0800,0000,1014         ;2498   =0      D_0,CALL,J/DC4                  ; SET UP A COUNTER
U 1133, 0100,003C,0180,0800,0000,127A         ;2499           D_D.LEFT2,SI/ZERO               ; R[7]=X40, TO KEEP
U 127A, 0100,003C,0180,0800,0000,127B         ;2500           D_D.LEFT2,SI/ZERO               ; TRACK OF HOW MANY
U 127B, 0001,003C,0180,0AB8,0000,1134         ;2501           R[7]_D                          ; DATA PATTERNS HAVE BEEN TESTED.
U 1134, 0000,003D,0180,0800,0000,111C         ;2502   =0      ERLOOP
U 1135, 0800,003C,0180,0A18,0000,127C         ;2503   DAL2:   D_R[3]                          ; SET UP THE OPERANDS.
U 127C, 0000,003C,01C0,0A20,0000,127D         ;2504           Q_R[4]
U 127D, 0000,003C,0180,0A50,0082,127E         ;2505           SC_R[0A]                        ; SET UP THE SHIFT COUNT
U 127E, 0D00,003C,0180,0800,0000,127F         ;2506           D_DAL.SC                        ; TEST INSTRUCTION
U 127F, 0001,003C,0180,0A90,0000,1280         ;2507           R[2]_D
U 1280, 0000,003C,01C0,0A28,0000,1281         ;2508           Q_R[5]                          ; GET THE EXPECTED RESULT
U 1281, 0001,203C,0180,0A88,0000,1282         ;2509           R[1]_Q
U 1282, 001D,2000,0180,0800,0010,1283         ;2510           ALU_Q-D,CLK.UBCC                ; COMPARE THE EXPECTED RESULT
U 1283, 0000,013C,0180,0800,0000,1136         ;2511           Z?                              ; WITH THE ACTUAL RESULT
U 1136, 0800,003C,0180,0A40,0000,12A5         ;2512   =0      D_R[8],J/DALERR                 ; REPORT ERROR.
U 1137, 0000,003C,0180,0A18,0000,1284         ;2513           LAB_R[3]                        ; NOW TEST THE COMPLEMENT PATTERNS.
U 1284, 0800,0028,0180,0A98,0000,1285         ;2514           AMX7LA,ALU/NOTA,D_ALU,R[3]_ALU ; LOAD OPERANDS.
U 1285, 0000,003C,0180,0A20,0000,1286         ;2515           LAB_R[4]
U 1286, 0000,0028,01C0,0AA0,0000,1287         ;2516           AMX7LA,ALU/NOTA,Q_ALU,R[4]_ALU
U 1287, 0000,003C,0180,0A50,0082,1288         ;2517           SC_R[0A]                        ; SET UP THE SHIFT COUNT
U 1288, 0D00,003C,0180,0800,0000,1289         ;2518           D_DAL.SC                        ; TEST INSTRUCTION.
```

```
U 1289, 0001,003C,0180,0A90,0000,128A  ;2519          R[2]_D                     ; SAVE THE RESULT
U 128A, 0000,0028,01C0,0A28,0000,128B  ;2520          LAB_R[5],AMX/LA,ALU/NOTA,Q_ALU ; CALCULATE THE EXPECTED
U 128B, 0001,203C,0180,0A88,0000,128C  ;2521          R[1]_Q                     ; RESULT.
U 128C, 001D,2000,0180,0800,0010,128D  ;2522          ALU_Q-D,CLK.UBCC           ; IS THE ACTUAL RESULT EQUAL
U 128D, 0000,013C,0180,0800,0000,1138  ;2523          Z?                         ; TO THE EXPECTED RESULT?
U 1138, 0800,003C,0180,0A40,0000,12A5  ;2524   =0     D_R[8],J/DALERR            ; REPORT ERROR
U 1139, 0000,003C,0180,0A18,0000,128E  ;2525   DAL3:  LAB_R[3]                   ; COMPUTE NEXT OPERANDS.
U 128E, 0800,0028,0180,0A98,0000,128F  ;2526          ALU_NOT.LA,R[3]_ALU,D_ALU
U 128F, 0000,003C,0180,0A20,0000,1290  ;2527          LAB_R[4]
U 1290, 0000,0028,01C0,0AA0,0000,1291  ;2528          ALU_NOT.LA,R[4]_ALU,Q_ALU
U 1291, 0500,003C,0000,0800,0000,1292  ;2529          D_D.LEFT,SI/0              ; SI=Q31
U 1292, 0001,003C,0180,0AC8,0000,1293  ;2530          R[9]_D
U 1293, 0800,003C,0180,0A18,0000,1294  ;2531          D_R[3]
U 1294, 0000,003C,0128,0A48,0000,1295  ;2532          LAB_R[9],Q_Q.LEFT,SI/2     ; SI=D31
U 1295, 0000,003C,0180,0A98,0000,1296  ;2533          R[3]_LA
U 1296, 0001,203C,0180,0AA0,0000,1297  ;2534          R[4]_Q
U 1297, 0800,003C,0180,0A28,0000,1298  ;2535          D_R[5]                     ; COMPUTE NEXT EXPECTED
U 1298, 0000,003C,01C0,0A30,0000,1299  ;2536          Q_R[6]                     ; RESULT.
U 1299, 0500,003C,0000,0800,0000,129A  ;2537          D_D.LEFT,SI/0
U 129A, 0001,003C,0180,0AC8,0000,129B  ;2538          R[9]_D
U 129B, 0800,003C,0180,0A28,0000,129C  ;2539          D_R[5]
U 129C, 0000,003C,0128,0A48,0000,129D  ;2540          LAB_R[9],Q_Q.LEFT,SI/2
U 129D, 0000,003C,0180,0AA8,0000,129E  ;2541          R[5]_LA
U 129E, 0001,203C,0180,0AB0,0000,129F  ;2542          R[6]_Q
U 129F, 0000,003C,0180,0A38,0000,12A0  ;2543          LAB_R[7]
U 12A0, 0018,0000,0580,0AB8,0010,12A1  ;2544          R[7]_LA-K[.1],CLK.UBCC     ; SEE IF FINISHED TESTING
U 12A1, 0000,013C,0180,0800,0000,113A  ;2545          Z?                         ; THIS SHIFT COUNT.
U 113A, 0000,003C,0180,0800,0000,1135  ;2546   =0     J/DAL2                     ; IF NOT CONTINUE
U 113B, 0000,003C,0180,0A50,0000,12A2  ;2547          LAB_R[0A]                  ; DECREMENT THE SHIFT COUNT
U 12A2, 0018,0000,0580,0AD0,0000,12A3  ;2548          R[0A]_LA-K[.1]
U 12A3, 0000,003C,0180,0A40,0010,12A4  ;2549          ALU_R[8],CLK.UBCC          ; SEE IF ALL SHIFT COUNTS
U 12A4, 0000,013C,0180,0800,0000,113C  ;2550          Z?                         ; HAVE BEEN TESTED.
U 113C, 0018,0000,0580,0AC0,0000,1274  ;2551   =0     R[8]_LA-K[.1],J/DAL1       ; IF NOT DECREMENT COUNTER, CONTINUE
U 113D, 0000,003C,0180,0800,0000,12B8  ;2552          J/DAL[100                  ; DONE!
                                       ;2553   ; WHEN AN ERROR IS ENCOUNTERED THE CONTENTS OF THESE RC REGISTERS
                                       ;2554   ; IS TYPED:
                                       ;2555   ;
                                       ;2556   ;      RC[0E] = EXPECTED RESULT (IN D)
                                       ;2557   ;      RC[0D] = GOT RESULT (IN D)
                                       ;2558   ;      RC[0C] = D OPERAND
                                       ;2559   ;      RC[0B] = Q OPERAND
                                       ;2560   ;      RC[0A] = SC VALUE USED IN SHIFT
                                       ;2561   ;
U 12A5, 0F00,003C,0180,0800,0000,113E  ;2562   DALERR: D_0
U 113E, 0000,003D,0180,0800,0000,1015  ;2563   =0     CALL,J/DC5
U 113F, 0001,003C,0180,09F8,0000,12A6  ;2564          RC[0F]_D
U 12A6, 0000,003C,0180,0A08,0000,12A7  ;2565          LAB_R[1]
U 12A7, 0000,003C,0180,09F0,0000,12A8  ;2566          RC[0E]_LA
U 12A8, 0000,003C,0180,0A10,0000,12A9  ;2567          LAB_R[2]
U 12A9, 0000,003C,0180,09E8,0000,12AB  ;2568          RC[0D]_LA
U 12AB, 0000,003C,0180,0A18,0000,12AC  ;2569          LAB_R[3]
U 12AC, 0000,003C,0180,09E0,0000,12AD  ;2570          RC[0C]_LA
U 12AD, 0000,003C,0180,0A20,0000,12AE  ;2571          LAB_R[4]
U 12AE, 0000,003C,0180,09D8,0000,12AF  ;2572          RC[0B]_LA
U 12AF, 0818,0039,1D80,09D0,0000,111E  ;2573          D_SC,RC[0A]_ALU,ERROR1
```

```
                                         ;2574   ; THIS ROUTINE IS CALLED TO SET UP THE EXPECTED RESULT
                                         ;2575   ; FOR TO FIRST OPERANDS USED WITH EACH SHIFT COUNT. THE
                                         ;2576   ; REMAINING RESULTS FOR THIS SHIFT COUNT ARE
                                         ;2577   ; COMPUTED USING THIS INITIAL ONE BY SHIFTING IT LEFT
                                         ;2578   ; EACH TIME THE OPERAND IS SHIFT LEFT TO PRODUCE THE NEXT
                                         ;2579   ; TEST DATA PATTERN.
U 12B0, 0818,0038,7580,0800,0000,12B1    ;2580   DALSUT: D_K[.20]
U 12B1, 0000,003C,0180,0A50,0082,12B2    ;2581           SC_R[0A]
U 12B2, 001C,2014,0180,0800,0010,12B3    ;2582           ALU_LA[A+B]D,CLK.UBCC
U 12B3, 0000,013C,0180,0800,0000,1140    ;2583           Z?
U 1140, 0000,003C,0180,0800,0000,12B4    ;2584   =0      J/DALST1
U 1141, 0818,003A,05F8,0800,0000,0001    ;2585           D_K[.1],Q_0,RETURN1
U 12B4, 001C,2034,0180,0800,0010,12B5    ;2586   DALST1: ALU_LA[AND]D,CLK.UBCC
U 12B5, 0000,013C,0180,0800,0000,1142    ;2587           Z?
U 1142, 0000,003C,0180,0800,0000,12B6    ;2588   =0      J/DALST2
U 1143, 0F03,001E,01C0,0800,0000,0001    ;2589           ALU_NOT.MASK,Q_ALU,D_0,RETURN1
U 12B6, 001C,2014,0180,0800,0082,12B7    ;2590   DALST2: ALU_LA[A+B]D,SC_ALU
U 12B7, 0803,001E,01F8,0800,0000,0001    ;2591           ALU_NOT.MASK,D_ALU,Q_0,RETURN1
U 12B8, 0000,003C,0180,0800,0000,1144    ;2592   DAL100: NOP
```

```
                                            ;2593           .PAGE   "TEST 65        EALU/A+1, EAMX/SC AND SMX/EALU TEST"
                                            ;2594   ;*******************************************************************
                                            ;2595   ;++
                                            ;2596   ; TEST  65      EALU/A+1, EAMX/SC AND SMX/EALU TEST
                                            ;2597   ;
                                            ;2598   ; TEST DESCRIPTION
                                            ;2599   ;       THIS IS A TEST OF THE SC INPUTS TO THE EAMX (THESE
                                            ;2600   ;       ARE SELECTED BY DEFAULT UNLESS DOING MSC/LOAD.STATE)
                                            ;2601   ;       THE EALU FUNCTION A+1 IS NOT TESTED COMPREHENSIVELY
                                            ;2602   ;       HERE BUT IS MERELY USED TO CHANGE THE DATA WHICH
                                            ;2603   ;       AFTER BEING INCREMENTED IS ROUTED THROUGH THE SMX
                                            ;2604   ;       BACK INTO THE SC.
                                            ;2605   ;
                                            ;2606   ; LOGIC DESCRIPTION
                                            ;2607   ;
                                            ;2608   ; ERROR DESCRIPTION
                                            ;2609   ;       EXPECTED DATA
                                            ;2610   ;       GOT DATA
                                            ;2611   ;
                                            ;2612   ;--
                                            ;2613   ;*******************************************************************
                                            ;2614   =0
U 1144, 0000,003D,0180,0800,0000,10B2       ;2615   EXPA:   NEWTST
U 1145, 0018,0038,0980,09F8,0000,12B9       ;2616           RC[OF]_K[.2]
U 12B9, 0018,0038,8580,0AA8,0000,12BA       ;2617           R[5]_K[.C]              ; SET UP A COUNTER, R[5]=0C
U 12BA, 0818,0038,6180,0800,0000,1146       ;2618           D_K[.F]
U 1146, 0100,003D,0380,0800,0000,101F       ;2619   =0      D_D.LEFT2,SI/7,CALL,J/DCF
U 1147, 0001,003C,0180,0AB0,0000,12BB       ;2620           R[6]_D                  ; R[6]=3FF, USED AS A MASK
U 12BB, 0018,0038,0580,0AA0,0000,1148       ;2621           R[4]_K[.1]              ; INITIAL DATA PATTERN
U 1148, 0000,003D,0180,0800,0000,111C       ;2622   =0      ERLOOP
U 1149, 0000,003C,0180,0A20,0082,12BC       ;2623   EXPA1:  ALU_R[4],SC_ALU         ; SET UP OPERAND
U 12BC, 0018,0014,05C0,0800,0080,D2BD       ;2624           EALU/A+1,SC_EALU,ALU_LA+K[.1],Q_ALU ; TEST INSTRUCRION
U 12BD, 0000,003C,0180,0A30,0000,12BE       ;2625           LAB_R[6]                ; COMPUTE EXPECTED RESULT
U 12BE, 001C,0034,01C0,09F0,0000,12BF       ;2626           ALU_LA[AND]Q,RC[OE]_ALU,Q_ALU
U 12BF, 0818,0038,1D80,09E8,0000,12C0       ;2627           D_SC,RC[OD]_ALU         ; GET ACTUAL RESULT
U 12C0, 001D,2000,0180,0800,0010,12C1       ;2628           ALU_Q-D,CLK.UBCC        ; IS IT CORRECT
U 12C1, 0000,013C,0180,0800,0000,114A       ;2629           Z?
U 114A, 0000,003D,0180,0800,0000,111E       ;2630   =0      ERROR1                  ; REPORT ERROR.
U 114B, 0000,0028,0180,0A20,0082,12C2       ;2631           LAB_R[4],AMX/LA,ALU/NOTA,SC_ALU ; NOW TEST COMPLEMENT PATTERN
U 12C2, 0000,0028,01C0,0800,0080,D2C3       ;2632           EALU/A+1,SC_EALU,ALU_NOT.LA,Q_ALU ; TEST INSTRUCTION
U 12C3, 0019,2014,05C0,0A30,0000,12C4       ;2633           LAB_R[6],Q_Q+K[.1]      ; COMPUTE EXPECTED RESULT
U 12C4, 001C,0034,01C0,09F0,0000,12C5       ;2634           ALU_LA[AND]Q,Q_ALU,RC[OE]_ALU
U 12C5, 0818,0038,1D80,09E8,0000,12C6       ;2635           D_SC,RC[OD]_ALU         ; GET ACTUAL RESULT
U 12C6, 001D,2000,0180,0800,0010,12C7       ;2636           ALU_Q-D,CLK.UBCC        : IS IT CORRECT
U 12C7, 0000,013C,0180,0800,0000,114C       ;2637           Z?
U 114C, 0000,003D,0180,0800,0000,111E       ;2638   =0      ERROR1                  ; REPORT ERROR
U 114D, 0000,003C,0180,0A28,0000,12C8       ;2639           LAB_R[5]                ; SEE IF ALL PATTERNS HAVE
U 12C8, 0018,0000,0580,0AA8,0010,12C9       ;2640           R[5]_LA-K[.1],CLK.UBCC  ; TESTED.
U 12C9, 0000,013C,0180,0800,0000,114E       ;2641           Z?
U 114E, 0000,003C,0180,0A20,0000,12CA       ;2642   =0      LAB_R[4],J/EXPA2        ; IF NOT SHIFT DATA AND CONTINUE
U 114F, 0000,003C,0180,0800,0000,12CB       ;2643           J/EXPA3
U 12CA, 0020,003C,0100,0AA0,0000,1149       ;2644   EXPA2:  AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4]_SHF,J/EXPA1
U 12CB, 0000,003C,0180,0800,0000,1150       ;2645   EXPA3:  NOP
```

```
                                                 .PAGE   "TEST 66        EALU/A TEST"
                                          ;*************************************************************
                                          ;++
                                          ; TEST  66      EALU/A TEST
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS IS A TEST OF THE EALU/A FUNCTION. A 1 IS
                                          ;       FLOATED ACROSS 0'S AND A 0 IS FLOATED ACROSS 1'S
                                          ;       TO GENERATE THE TEST DATA PATTERNS USED.
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       EXPECTED DATA
                                          ;       GOT DATA
                                          ;
                                          ;--
                                          ;*************************************************************
                                          =0
U 1150, 0000,003D,0180,0800,0000,10B2     EXPB:   NEWTST
U 1151, 0018,0038,0980,09F8,0000,12CC             RC[0F]_K[.2]
U 12CC, 0018,0038,8580,0AA8,0000,12CD             R[5]_K[.C]                ; SET UP A COUNTER, R[5]=0C
U 12CD, 0818,0038,6180,0800,0000,1152             D_K[.F]                   ; SET UP A MASK, R[6]=3FF
U 1152, 0100,003D,0380,0800,0000,101F     =0      D_D.LEFT2,SI/7,CALL,J/DCF
U 1153, 0001,003C,0180,0AB0,0000,12CE             R[6]_D
U 12CE, 0018,0038,0580,0AA0,0000,1156             R[4]_K[.1]                ; INITIALIZE THE DATA PATTERN.
U 1156, 0000,003D,0180,0800,0000,111C     =0      ERLOOP
U 1157, 0000,003C,0180,0A20,0082,12CF     EXPB1:  ALU_R[4],SC_ALU           ; LOAD TEST PATTERN INTO SC.
U 12CF, 0000,003C,01C0,0800,0080,12D0             EALU/A,SC_EALU,Q_LA       ; TEST INSTRUCTION.
U 12D0, 0000,003C,0180,0A30,0000,12D1             LAB_R[6]                  ; COMPUTE THE EXPECTED RESULT.
U 12D1, 001C,0034,01C0,09F0,0000,12D2             ALU_LA[AND]Q,Q_ALU,RC[0E]_ALU
U 12D2, 0818,0038,1D80,09E8,0000,12D3             D_SC,RC[0D]_ALU           ; GET THE ACTUAL RESULT.
U 12D3, 001D,2000,0180,0800,0010,12D4             ALU_Q-D,CLK.UBCC          ; IS IT CORRECT?
U 12D4, 0000,013C,0180,0800,0000,1158             Z?
U 1158, 0000,003D,0180,0800,0000,111E     =0      ERROR1                    ; REPORT ERROR.
U 1159, 0000,0028,0180,0A20,0082,12D5             LAB_R[4],AMX/LA,ALU/NOTA,SC_ALU ; TEST COMPLEMENT PATTERN
U 12D5, 0000,0028,01C0,0800,0080,12D6             EALU/A,SC_EALU,ALU_NOT.LA,Q_ALU ; TEST INSTRUCTION
U 12D6, 0000,003C,0180,0A30,0000,12D7             LAB_R[6]                  ; COMPUTE THE EXPECTED RESULT.
U 12D7, 001C,0034,01C0,09F0,0000,12D8             ALU_LA[AND]Q,Q_ALU,RC[0E]_ALU
U 12D8, 0818,0038,1D80,09E8,0000,12D9             D_SC,RC[0D]_ALU           ; GET THE ACTUAL RESULT.
U 12D9, 001D,2000,0180,0800,0010,12DA             ALU_Q-D,CLK.UBCC          ; IS IT CORRECT.
U 12DA, 0000,013C,0180,0800,0000,115A             Z?
U 115A, 0000,003D,0180,0800,0000,111E     =0      ERROR1                    ; REPORT ERROR.
U 115B, 0000,003C,0180,0A28,0000,12DB             LAB_R[5]                  ; HAVE ALL TEST PATTERNS
U 12DB, 0018,0000,0580,0AA8,0010,12DC             R[5]_LA-K[.1],CLK.UBCC    ; BEEN TRIED.
U 12DC, 0000,013C,0180,0800,0000,115C             Z?
U 115C, 0000,003C,0180,0A20,0000,12DD     =0      LAB_R[4],J/EXPB2          ; IF NOT SHIFT DATA AND CONTINUE.
U 115D, 0000,003C,0180,0800,0000,12DE             J/EXPB3
U 12DD, 0020,003C,0100,0AA0,0000,1157     EXPB2:  AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4]_SHF,J/EXPB1
U 12DE, 0000,003C,0180,0800,0000,115E     EXPB3:  NOP
```

```
                                              .PAGE   "TEST 67        EBMX/KMX AND EALU/B TEST"
                                         ;***********************************************************
                                         ;++
                                         ; TEST  67      EBMX/KMX AND EALU/B TEST
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS TEST TAKES A DATA PATTERN FROM THE SC, PASSES IT
                                         ;       THROUGH THE KMX, THEN THROUGH THE EBMX AND FINALLY
                                         ;       THROUGH THE EALU. DATA PATTERNS USED ARE THOSE GENERATED
                                         ;       BY FLOATING A 1 THROUGH 0'S AND A 0 THROUGH 1'S.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       EXPECTED DATA
                                         ;       GOT DATA
                                         ;
                                         ;--
                                         ;***********************************************************
                                         =0
U 115E, 0000,003D,0180,0800,0000,10B2    EXPC:   NEWTST
U 115F, 0018,0038,0980,09F8,0000,12DF            RC[OF]_K[.2]
U 12DF, 0018,0038,8580,0AA8,0000,12E0            R[5]_K[.C]              ; SET UP A COUNTER, R[5]=0C
U 12E0, 0818,0038,6180,0800,0000,1160            D_K[.F]                 ; SET UP A MASK, R[6]=3FF
U 1160, 0100,003D,0380,0800,0000,101F    =0      D_D.LEFT2,SI/7,CALL,J/DCF
U 1161, 0001,003C,0180,0AB0,0000,12E1            R[6]_D
U 12E1, 0018,0038,0580,0AA0,0000,1162            R[4]_K[.1]              ; INITIALIZE THE TEST DATA PATTERN.
U 1162, 0000,003D,0180,0800,0000,111C    =0      ERLOOP
U 1163, 0000,003C,01C0,0A20,0082,12E2    EXPC1:  Q_R[4],SC_ALU           ; SET UP THE OPERAND
U 12E2, 0000,003C,1D80,0A30,0084,72E3            KMX/SC,EBMX/KMX,EALU/B,SC_EALU,LAB_R[6] ; TEST INSTRUCTION
U 12E3, 001C,0034,01C0,09F0,0000,12E4            ALU_LA[AND]Q,RC[OE]_ALU,Q_ALU ; COMPUTE EXPECTED RESULT
U 12E4, 0818,0038,1D80,09E8,0000,12E5            D_SC,RC[OD]_ALU         ; GET ACTUAL RESULT
U 12E5, 001D,2000,0180,0800,0010,12E6            ALU_Q-D,CLK.UBCC        ; IS IT CORRECT?
U 12E6, 0000,013C,0180,0800,0000,1164            Z?
U 1164, 0000,003D,0180,0800,0000,111E    =0      ERROR1                  ; REPORT ERROR
U 1165, 0000,0028,01C0,0A20,0082,12E7            LAB_R[4],AMX/LA,ALU/NOTA,SC_ALU,Q_ALU ; USE COMPLEMENT PATTERN
U 12E7, 0000,003C,1D80,0A30,0084,72E8            KMX7SC,EBMX/KMX,EALU/B,SC_EALU,LAB_R[6] ; TEST INSTRUCTION
U 12E8, 001C,0034,01C0,09F0,0000,12E9            ALU_LA[AND]Q,RC[OE]_ALU,Q_ALU ; COMPUTE EXPECTED RESULT
U 12E9, 0818,0038,1D80,09E8,0000,12EA            D_SC,RC[OD]_ALU         ; GET ACTUAL RESULT.
U 12EA, 001D,2000,0180,0800,0010,12EB            ALU_Q-D,CLK.UBCC        ; IS IT CORRECT?
U 12EB, 0000,013C,0180,0800,0000,1166            Z?
U 1166, 0000,003D,0180,0800,0000,111E    =0      ERROR1                  ; REPORT ERROR
U 1167, 0000,003C,0180,0A28,0000,12EC            LAB_R[5]                ; SEE IF ALL PATTERNS HAVE BEEN TESTED
U 12EC, 0018,0000,0580,0AA8,0010,12ED            R[5]_LA-K[.1],CLK.UBCC
U 12ED, 0000,013C,0180,0800,0000,1168            Z?
U 1168, 0000,003C,0180,0A20,0000,12EE    =0      LAB_R[4],J/EXPC2        ; IF NOT SHIFT DATA AND CONTINUE
U 1169, 0000,003C,0180,0800,0000,12EF            J/EXPC3
U 12EE, 0020,003C,0100,0AA0,0000,1163    EXPC2:  AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4]_SHF,J/EXPC1
U 12EF, 0000,003C,0180,0800,0000,116A    EXPC3:  NOP
```

```
                                          ;2745          .PAGE   "TEST 68        FE AND SMX/FE TEST"
                                          ;2746   ;**********************************************************
                                          ;2747   ;++
                                          ;2748   ; TEST  68      FE AND SMX/FE TEST
                                          ;2749   ;
                                          ;2750   ; TEST DESCRIPTION
                                          ;2751   ;       THIS IS A TEST OF THE FE LOAD FUNCTION, THE FE REGISTER'S
                                          ;2752   ;       DATA INTEGRITY AND THE SMX FE INPUTS. DATA IS GENERATED USING
                                          ;2753   ;       A 1 IN 0'S AND A 0 IN 1'S.
                                          ;2754   ;
                                          ;2755   ; LOGIC DESCRIPTION
                                          ;2756   ;
                                          ;2757   ; ERROR DESCRIPTION
                                          ;2758   ;       EXPECTED RESULT
                                          ;2759   ;       GOT RESULT
                                          ;2760   ;
                                          ;2761   ;--
                                          ;2762   ;**********************************************************
                                          ;2763   =0
U 116A, 0000,003D,0180,0800,0000,10B2     ;2764   EXPD:   NEWTST
U 116B, 0018,0038,0980,09F8,0000,12F0     ;2765           RC[0F]_K[.2]
U 12F0, 0018,0038,8580,0AA8,0000,12F1     ;2766           R[5]_K[.C]              ; SET UP A COUNTER, R[5]=0C
U 12F1, 0818,0038,6180,0800,0000,116C     ;2767           D_K[.F]                 ; SET UP A MASK, R[6]=3FF
U 116C, 0100,003D,0380,0800,0000,101F     ;2768   =0      D_D.LEFT2,SI/7,CALL,J/DCF
U 116D, 0001,003C,0180,0AB0,0000,12F2     ;2769           R[6]_D
U 12F2, 0018,0038,0580,0AA0,0000,116E     ;2770           R[4]_K[.1]              ; INITIALIZE TEST DATA PATTERN
U 116E, 0000,003D,0180,0800,0000,111C     ;2771   =0      ERLOOP
U 116F, 0000,003C,01C0,0A20,0082,12F3     ;2772   EXPD1:  Q_R[4],SC_ALU           ; SET UP THE OPERAND
U 12F3, 0018,0038,C180,0A30,0182,12F4     ;2773           EALU/A,FEK/LOAD,ALU_K[.FFFF],SC_ALU,LAB_R[6] ; TEST INSTRUCTION
U 12F4, 0000,003C,C180,0800,0004,72F5     ;2774           KMX/.FFFF,EBMX/KMX,EALU/B ; CHANGE THE SC CONTENTS
U 12F5, 001C,0034,01C0,09F0,0081,12F6     ;2775           SMX/FE,SCK/LOAD,ALU_LA[AND]Q,RC[0E]_ALU,Q_ALU ; TEST INSTRUCTION
U 12F6, 0818,0038,1D80,09E8,0000,12F7     ;2776           D_SC,RC[0D]_ALU         ; READ THE RESULT
U 12F7, 001D,2000,0180,0800,0010,12F8     ;2777           ALU_Q-D,CLK.UBCC        ; IS IT CORRECT?
U 12F8, 0000,013C,0180,0800,0000,1170     ;2778           Z?
U 1170, 0000,003D,0180,0800,0000,111E     ;2779   =0      ERROR1                  ; REPORT ERROR.
U 1171, 0000,0028,01C0,0A20,0082,12F9     ;2780           LAB_R[4],ALU_NOT.LA,Q_ALU,SC_ALU ; TEST COMPLEMENT PATTERN
U 12F9, 0018,0038,1980,0A30,0182,12FA     ;2781           EALU/A,FEK/LOAD,ALU_0(K),SC_ALU,LAB_R[6] ; TEST INSTRUCTION
U 12FA, 0000,003C,1980,0800,0004,72FB     ;2782           KMX/ZERO,EBMX/KMX,EALU/B ; CHANGE SC
U 12FB, 001C,0034,01C0,09F0,0081,12FC     ;2783           SMX/FE,SCK/LOAD,ALU_LA[AND]Q,RC[0E]_ALU,Q_ALU ; READ FE
U 12FC, 0818,0038,1D80,09E8,0000,12FD     ;2784           D_SC,RC[0D]_ALU         ; GET THE RESULT.
U 12FD, 001D,2000,0180,0800,0010,12FE     ;2785           ALU_Q-D,CLK.UBCC        ; IS IT CORRECT?
U 12FE, 0000,013C,0180,0800,0000,1172     ;2786           Z?
U 1172, 0000,003D,0180,0800,0000,111E     ;2787   =0      ERROR1                  ; REPORT ERROR
U 1173, 0000,003C,0180,0A28,0000,12FF     ;2788           LAB_R[5]                ; HAVE ALL PATTERNS BEEN TRIED?
U 12FF, 0018,0000,0580,0AA8,0010,1300     ;2789           R[5]_LA-K[.1],CLK.UBCC
U 1300, 0000,013C,0180,0800,0000,1174     ;2790           Z?
U 1174, 0000,003C,0180,0A20,0000,1301     ;2791   =0      LAB_R[4],J/EXPD2        ; IF NOT SHIFT DATA AND CONTINUE
U 1175, 0000,003C,0180,0800,0000,1302     ;2792           J/EXPD3
U 1301, 0020,003C,0100,0AA0,0000,116F     ;2793   EXPD2:  AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4]_SHF,J/EXPD1
U 1302, 0000,003C,0180,0800,0000,1176     ;2794   EXPD3:  NOP
```

```
                                            ;2795          .PAGE   "TEST 69       EBMX/FE TEST"
                                            ;2796   ;**************************************************************
                                            ;2797   ;++
                                            ;2798   ; TEST  69      EBMX/FE TEST
                                            ;2799   ;
                                            ;2800   ; TEST DESCRIPTION
                                            ;2801   ;       THIS IS A TEST OF THE FE INPUTS TO THE EBMX. TEST DATA
                                            ;2802   ;       IS GENERATED BY FLOATING A 1 IN 0'S AND A 0 IN 1'S.
                                            ;2803   ;
                                            ;2804   ; LOGIC DESCRIPTION
                                            ;2805   ;
                                            ;2806   ; ERROR DESCRIPTION
                                            ;2807   ;       EXPECTED DATA
                                            ;2808   ;       GOT DATA
                                            ;2809   ;
                                            ;2810   ;--
                                            ;2811   ;**************************************************************
                                            ;2812   =0
U 1176, 0000,003D,0180,0800,0000,10B2      ;2813   EXPE:   NEWTST
U 1177, 0018,0038,0980,09F8,0000,1303      ;2814           RC[0F]_K[.2]
U 1303, 0018,0038,8580,0AA8,0000,1304      ;2815           R[5]_K[.C]              ; SET UP A COUNTER, R[5]=0C
U 1304, 0818,0038,6180,0800,0000,1178      ;2816           D_K[.F]                 ; SET UP A MASK, R[6]=3FF
U 1178, 0100,003D,0380,0800,0000,101F      ;2817   =0      D_D.LEFT2,SI/7,CALL,J/DCF
U 1179, 0001,003C,0180,0AB0,0000,1305      ;2818           R[6]_D
U 1305, 0018,0038,0580,0AA0,0000,117A      ;2819           R[4]_K[.1]              ; INITIALIZE THE DATA PATTERN
U 117A, 0000,003D,0180,0800,0000,111C      ;2820   =0      ERLOOP
U 117B, 0000,003C,01C0,0A20,0082,1306      ;2821   EXPE1:  LAB_R[4],ALU_LA,SC_ALU,Q_ALU ; SET UP THE OPERAND
U 1306, 0018,0038,1980,0A30,0182,1307      ;2822           EALU/A,FEK/LOAD,ALU_0(K),SC_ALU,LAB_R[6] ; LOAD FE
                                            ;2823                                   ; TEST INSTRUCTION:
U 1307, 001C,0034,1DC0,09F0,0080,7308      ;2824           EBMX/FE,KMX/SC,EALU/B,SC_EALU,ALU_LA[AND]Q,RC[0E]_ALU,Q_ALU
U 1308, 0818,0038,1D80,09E8,0000,1309      ;2825           D_SC,RC[0D]_ALU         ; GET THE RESULT
U 1309, 001D,2000,0180,0800,0010,130A      ;2826           ALU_Q-D,CLK.UBCC        ; WAS IT CORRECT?
U 130A, 0000,013C,0180,0800,0000,117C      ;2827           Z?
U 117C, 0000,003D,0180,0800,0000,111E      ;2828   =0      ERROR1                  ; REPORT ERROR.
                                            ;2829                                   ; NOW TEST COMPLEMENT DATA
U 117D, 0000,0028,01C0,0A20,0082,130B      ;2830           LAB_R[4],AMX/LA,ALU/NOTA,SC_ALU,Q_ALU ; SET UP THE OPERAND
U 130B, 0018,0038,C180,0A30,0182,130C      ;2831           EALU/A,FEK/LOAD,ALU_K[.FFFF],SC_ALU,LAB_R[6] ; LOAD FE
                                            ;2832                                   ; TEST INSTRUCTION:
U 130C, 001C,0034,1DC0,09F0,0080,730D      ;2833           EBMX/FE,KMX/SC,EALU/B,SC_EALU,ALU_LA[AND]Q,RC[0E]_ALU,Q_ALU
U 130D, 0818,0038,1D80,09E8,0000,130E      ;2834           D_SC,RC[0D]_ALU         ; GET THE RESULT
U 130E, 001D,2000,0180,0800,0010,130F      ;2835           ALU_Q-D,CLK.UBCC        ; WAS IT CORRECT?
U 130F, 0000,013C,0180,0800,0000,117E      ;2836           Z?
U 117E, 0000,003D,0180,0800,0000,111E      ;2837   =0      ERROR1                  ; REPORT ERROR
U 117F, 0000,003C,0180,0A28,0000,1310      ;2838           LAB_R[5]                ; HAVE ALL PATTERNS BEEN TRIED?
U 1310, 0018,0000,0580,0AA8,0010,1311      ;2839           R[5]_LA-K[.1],CLK.UBCC
U 1311, 0000,013C,0180,0800,0000,1180      ;2840           Z?
U 1180, 0000,003C,0180,0A20,0000,1312      ;2841   =0      LAB_R[4],J/EXPE2        ; IF NOT SHIFT DATA AND CONTINUE.
U 1181, 0000,003C,0180,0800,0000,1313      ;2842           J/EXPE3
U 1312, 0020,003C,0100,0AA0,0000,117B      ;2843   EXPE2:  AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4]_SHF,J/EXPE1
U 1313, 0000,003C,0180,0800,0000,1182      ;2844   EXPE3:  NOP
```

```
                                                    ;2845           .PAGE   "TEST 6A        EBMX/AMX.EXP TEST"
                                                    ;2846   ;**************************************************************
                                                    ;2847   ;++
                                                    ;2848   ; TEST  6A      EBMX/AMX.EXP TEST
                                                    ;2849   ;
                                                    ;2850   ; TEST DESCRIPTION
                                                    ;2851   ;       THIS IS A TEST OF THE AMX.EXP (AMX<14:07>) INPUTS TO THE
                                                    ;2852   ;       EBMX. TEST PATTERNS ARE GENERATED BY FLOATING A 1 THROUGH
                                                    ;2853   ;       0'S AND A 0 THROUGH 1'S.
                                                    ;2854   ;
                                                    ;2855   ; LOGIC DESCRIPTION
                                                    ;2856   ;
                                                    ;2857   ; ERROR DESCRIPTION
                                                    ;2858   ;       EXPECTED DATA
                                                    ;2859   ;       GOT DATA
                                                    ;2860   ;
                                                    ;2861   ;--
                                                    ;2862   ;**************************************************************
                                                    ;2863   =0
U 1182, 0000,003D,0180,0800,0000,10B2               ;2864   EXPF:   NEWTST
U 1183, 0018,0038,0980,09F8,0000,1314               ;2865           RC[0F]_K[.2]
U 1314, 0018,0038,8580,0AA8,0000,1315               ;2866           R[5]_K[.C]                  ; SET UP A COUNTER R[5]=0C
U 1315, 0018,0038,4980,0AB0,0000,1316               ;2867           R[6]_K[.FF]                 ; SET UP A MASK, R[6]=0FF
U 1316, 0018,0038,0580,0A98,0000,1317               ;2868           R[3]_K[.1]                  ; SET UP THE EXPECTED DATA PATTERN
U 1317, 0018,0038,4180,0AA0,0000,1184               ;2869           R[4]_K[.80]                 ; INITIALIZE THE TEST DATA PATTERN
U 1184, 0000,003D,0180,0800,0000,111C               ;2870   =0      ERLOOP
U 1185, 0000,003C,01C0,0A18,0000,1318               ;2871   EXPF1:  Q_R[3]                      ; EXPECTED RESULT
U 1318, 0018,0038,1980,0A20,0082,1319               ;2872           LAB_R[4],ALU_0(K),SC_ALU ; SC=0
U 1319, 0000,003C,0180,0800,0100,131A               ;2873           EALU/A,FE_EALU              ; FE=0
                                                    ;2874                                       ; TEST INSTRUCTION
U 131A, 0000,003C,1D80,0800,0088,731B               ;2875           AMX/LA,EBMX/AMX.EXP,EALU/B,SC_EALU,KMX/SC
U 131B, 0000,003C,0180,0A30,0000,131C               ;2876           LAB_R[6]                    ; COMPUTE EXPECTED RESULT
U 131C, 001C,0034,01C0,09F0,0000,131D               ;2877           ALU_LA[AND]Q,RC[0E]_ALU,Q_ALU
U 131D, 0818,0038,1D80,09E8,0000,131E               ;2878           D_SC,RC[0D]_ALU             ; GET ACTUAL RESULT
U 131E, 001D,2000,0180,0800,0010,131F               ;2879           ALU_Q-D,CLK.UBCC            ; WAS IT CORRECT?
U 131F, 0000,013C,0180,0800,0000,1186               ;2880           Z?
U 1186, 0000,003D,0180,0800,0000,111E               ;2881   =0      ERROR1                      ; REPORT ERROR.
U 1187, 0000,0028,01C0,0A18,0000,1320               ;2882           LAB_R[3],ALU_NOT.LA,Q_ALU ; COMPLEMENT DATA PATTERN
U 1320, 0018,0038,C180,0A20,0082,1321               ;2883           LAB_R[4],ALU_K[.FFFF],SC_ALU ; SC=3FF
U 1321, 0000,0028,0180,0AC0,0100,1322               ;2884           EALU/A,FE_EALU,ALU_NOT.LA,R[8]_ALU ; FE=3FF
                                                    ;2885                                       ; TEST INSTRUCTION
U 1322, 0000,003C,1D80,0A40,0088,7323               ;2886           LAB_R[8],AMX/LA,EBMX/AMX.EXP,EALU/B,SC_EALU,KMX/SC
U 1323, 0000,003C,0180,0A30,0000,1324               ;2887           LAB_R[6]                    ; COMPUTE EXPECTED RESULT
U 1324, 001C,0034,01C0,09F0,0000,1325               ;2888           ALU_LA[AND]Q,RC[0E]_ALU,Q_ALU
U 1325, 0818,0038,1D80,09E8,0000,1326               ;2889           D_SC,RC[0D]_ALU             ; GET ACTUAL RESULT
U 1326, 001D,2000,0180,0A28,0010,1327               ;2890           ALU_Q-D,CLK.UBCC,LAB_R[5]          ; WAS IT CORRECT?
U 1327, 0000,013C,0180,0800,0000,1188               ;2891           Z?
U 1188, 0000,003D,0180,0800,0000,111E               ;2892   =0      ERROR1                      ; REPORT ERROR
U 1189, 0000,003C,0180,0A28,0000,1328               ;2893           LAB_R[5]
U 1328, 0018,0000,0580,0AA8,0010,1329               ;2894           R[5]_LA-K[.1],CLK.UBCC      ; TRIED ALL PATTERNS?
U 1329, 0000,013C,0180,0800,0000,118A               ;2895           Z?
U 118A, 0000,003C,0180,0A20,0000,132A               ;2896   =0      LAB_R[4],J/EXPF2            ; IF NOT SHIFT DATA AND CONTINUE
U 118B, 0000,003C,0180,0800,0000,132D               ;2897           J/EXPF3
U 132A, 0020,003C,0100,0AA0,0000,132B               ;2898   EXPF2:  AMX/LA,ALU/A,SHF/LEFT,SI/2,R[4]_SHF
U 132B, 0000,003C,0180,0A18,0000,132C               ;2899           LAB_R[3]
```

```
U 132C, 0020,003C,0100,0A98,0000,1185    ;2900            AMX/LA,ALU/A,SHF/LEFT,SI/2,R[3]_SHF,J/EXPF1
U 132D, 0000,003C,0180,0800,0000,118C    ;2901    EXPF3:  NOP
```

```
                                                    .PAGE   "TEST 6B        STATE REGISTER AND EAMX/STATE TEST"
                                            ;*************************************************************
                                            ;++
                                            ; TEST  6B      STATE REGISTER AND EAMX/STATE TEST
                                            ;
                                            ; TEST DESCRIPTION
                                            ;       THIS IS A TEST OF THE MSC/LOAD STATE FUNCTION,
                                            ;       THE STATE REHISTER'S DATA INTEGRITY AND THE STATE
                                            ;       REGISTER INPUTS TO THE EAMX. TEST DATA IS GENERATED
                                            ;       BY FLOATING A 1 IN 0'S AND A 0 IN 1'S.
                                            ;
                                            ; LOGIC DESCRIPTION
                                            ;       NOTE THAT THE EAMX SELECT CONTROL IS DICTATED BY THE
                                            ;       MSC FUNCTION LOAD STATE. IF THE MSC FUNCTION IS LOAD STATE
                                            ;       THEN THE EAMX SELECTS THE STATE REGISTER, OTHERWISE
                                            ;       IT SELECTS THE SC.
                                            ;
                                            ; ERROR DESCRIPTION
                                            ;       EXPECTED DATA
                                            ;       GOT DATA
                                            ;
                                            ;--
                                            ;*************************************************************
                                            =0
U 118C, 0000,003D,0180,0800,0000,10B2       EXPG:   NEWTST
U 118D, 0018,0038,0980,09F8,0000,132E               RC[OF]_K[.2]
U 132E, 0018,0038,D980,0AA8,0000,132F               R[5]_K[.9]              ; SET UP A COUNTER, R[5]=9
U 132F, 0018,0038,4980,0AB0,0000,1330               R[6]_K[.FF]             ; SET UP A MASK, R[6]=0FF
U 1330, 0018,0038,0580,0AA0,0000,118E               R[4]_K[.1]              ; INITIALIZE THE TEST DATA PATTERN
U 118E, 0000,003D,0180,0800,0000,111C       =0      ERLOOP
U 118F, 0000,003C,01C0,0A20,0082,1331       EXPG1:  LAB_R[4],ALU_LA,SC_ALU,Q_ALU ; SET UP THE OPERAND
                                                                            ; LOAD STATE
U 1331, 0003,003C,1D80,0A30,1486,7332               EBMX_K[SC],EALU/B,MSC/LOAD.STATE,ALU_O(A),SC_ALU,LAB_R[6]
U 1332, 0000,003C,C180,0800,0004,7333               KMX/.FFFF,EBMX/KMX,EALU/B ; INSTRUCTION TO CHANGE STATE INPUTS
                                                                            ; TO INSURE STATE ISN'T ALWAYS
                                                                            ; BEING CLOCKED.
                                                                            ; READ STATE
U 1333, 001C,0034,01C0,09F0,1480,1334               MSC/LOAD.STATE,EALU/A,SC_EALU,ALU_LA[AND]Q,RC[OE]_ALU,Q_ALU
U 1334, 0816,0038,1D80,09E8,0000,1335               D_SC,RC[OD]_ALU         ; GET THE RESULT
U 1335, 001D,2000,0180,0800,0010,1336               A[U_Q-D,CLK.UBCC        ; IS IT CORRECT?
U 1336, 0000,013C,0180,0800,0000,1190               Z?
U 1190, 0000,003D,0180,0800,0000,111E       =0      ERROR1                  ; REPORT ERROR
U 1191, 0000,0028,01C0,0A20,0082,1337               LAB_R[4],AMX/LA,ALU/NOTA,SC_ALU,Q_ALU ; TEST COMPLEMENT DATA
U 1337, 0000,003C,1D80,0800,1404,7338               EBMX_K[SC],EALU/B,MSC/LOAD.STATE ; LOAD STATE
U 1338, 0018,0038,C180,0A30,0082,1339               ALU_K[.FFFF],SC_ALU,LAB_R[6] ; THIS INSTRUCTION CHANGES THE
                                                                            ; DATA AT THE STATE REGISTER
                                                                            ; INPUTS, INSURING THAT THE
                                                                            ; REGISTER IS NOT ALWAYS
                                                                            ; BEING CLOCKED
                                                                            ; READ STATE
U 1339, 001C,0034,01C0,09F0,1480,133A               MSC/LOAD.STATE,EALU/A,SC_EALU,ALU_LA[AND]Q,RC[OE]_ALU,Q_ALU
U 133A, 0000,003C,1980,0800,0004,733B               KMX/ZERO,EBMX/KMX,EALU/B
U 133B, 0818,0038,1D80,09E8,0000,133C               D_SC,RC[OD]_ALU         ; GET RESULT
U 133C, 001D,2000,0180,0800,0010,133D               A[U_Q-D,CLK.UBCC        ; IS IT CORRECT?
U 133D, 0000,013C,0180,0800,0000,1192               Z?
```

```
U 1192, 0000,003D,0180,0800,0000,111E   ;2957   =0      ERROR1                   ; REPORT ERROR
U 1193, 0000,003C,0180,0A28,0000,133E   ;2958           LAB_R[5]
U 133E, 0018,0000,0580,0AA8,0010,133F   ;2959           R[5]_LA-K[.1],CLK.UBCC   ; TRIED ALL DATA PATTERNS?
U 133F, 0000,013C,0180,0800,0000,1194   ;2960           Z?
U 1194, 0000,003C,0180,0A20,0000,1340   ;2961   =0      LAB_R[4],J/EXPG2         ; IF NOT SHIFT DATA AND CONTINUE.
U 1195, 0000,003C,0180,0800,0000,1341   ;2962           J/EXPG3
U 1340, 0020,003C,0100,0AA0,0000,118F   ;2963   EXPG2:  ALU_LA,SHF/LEFT,SI/2,R[4]_SHF,J/EXPG1
U 1341, 0000,003C,0180,0800,0000,1196   ;2964   EXPG3:  NOP
```

```
                                              .PAGE   "TEST 6C        EALU TEST"
                                      ;****************************************************************
                                      ;++
                                      ; TEST  6C       EALU TEST
                                      ;
                                      ; TEST DESCRIPTION
                                      ;       THIS IS A TEST OF EXPONENT SECTION'S ALU. ALL
                                      ;       EALU FUNCTIONS ARE TESTED, EXCEPT EALU/NABS.A-B
                                      ;       WHICH IS TESTED IN THE NEXT TEST. TEST DATA
                                      ;       PATTERNS ARE GENERATED IN SUCH A WAY AS TO TRY
                                      ;       EVERY POSSIBLE COMBINATION OF A<3:0>, B<3:0>
                                      ;       AND CIN WITH EACH FUNCTION ON EACH 4 BIT SLICE
                                      ;       ALU CHIP IN THE CIRCUIT.
                                      ;       SUBTEST 1 TESTS THE FUNCTION A
                                      ;       SUBTEST 2 TESTS THE FUNCTION B
                                      ;       SUBTEST 3 TESTS THE FUNCTION A.OR.B
                                      ;       SUBTEST 4 TESTS THE FUNCTION A.ANDNOT.B
                                      ;       SUBTEST 5 TESTS THE FUNCTION A.PLUS.B
                                      ;       SUBTEST 6 TESTS THE FUNCTION A.MINUS.B
                                      ;       SUBTEST 7 TESTS THE FUNCTION A.PLUS.1
                                      ;       NOTE THAT EXPECTED RESULTS ARE CALCULATED USING
                                      ;       THE 32 BIT ALU IN THE DATA PATHS WHICH HAS ALREADY
                                      ;       BEEN TESTED.
                                      ;
                                      ; LOGIC DESCRIPTION
                                      ;
                                      ; ERROR DESCRIPTION
                                      ;       EXPECTED RESULT
                                      ;       ACTUAL RESULT
                                      ;       A OPERAND (FROM SC)
                                      ;       B OPERAND (FROM FE)
                                      ;       EALU FUNCTION BEING TESTED AS GIVEN BY:
                                      ;               6       A
                                      ;               5       B
                                      ;               4       A.OR.B
                                      ;               3       A.ANDNOT.B
                                      ;               2       A.PLUS.B
                                      ;               1       A.MINUS.B
                                      ;               0       A.PLUS.1
                                      ;
                                      ;--
                                      ;****************************************************************
                                      =0
U 1196, 0000,003D,0180,0800,0000,1082 EALU:   NEWTST
U 1197, 0818,0038,1180,0800,0000,1342         D_K[.4]
U 1342, 0019,0014,0580,09F8,0000,1343         A[U_D+K[.1],RC[0F]_ALU
U 1343, 0018,0038,D580,0AC8,0000,1198         R[9]_K[.6]                ; SET UP A FUNCTION COUNTER.
                                      =0
U 1198, 0000,003D,0180,0800,0000,11F5 EALU1:  SUBTEST
U 1199, 0018,0038,6580,0AF0,0000,1344         R[0E]_K[.10]              ; SET UP AN OPERAND COUNTER
U 1344, 0018,0038,8180,0AE8,0000,1345         R[0D]_K[.3FF]             ; SET UP A MASK
U 1345, 0800,003C,0180,0A48,0000,119A         D_R[9]                    ; GO SET UP THE LOOP ON ERROR
U 119A, 0018,1939,1980,0AF8,0000,1090 =0      A[U_0(K),R[0F]_ALU,CALL,D3-0?,J/EALUT1 ; ADDRESS
U 119B, 0003,003C,0180,0A98,0000,1346         R[3]_0                    ; INITIALIZE THE A OPERAND
U 1346, 0000,003C,0180,0A70,0000,1347         LAB_R[0E]                 ; AND COUNTER.
```

```
U 1347, 0000,003C,0180,0AB0,0000,1348    ;3020              R[6]_LA
                                         ;3021      ; FIRST TEST EALU<03:00>
U 1348, 0003,003C,0180,0AA0,0000,1349    ;3022      EALU2:  R[4]_0                   ; INITIALIZE THE B OPERAND
U 1349, 0000,003C,0180,0A70,0000,134A    ;3023              LAB_R[0E]                ; AND COUNTER.
U 134A, 0000,003C,0180,0AB8,0000,134B    ;3024              R[7]_LA
U 134B, 0000,003C,0180,0A20,0082,134C    ;3025      EALU3:  SC_R[4]                  ; PUT B OPERAND IN FE
U 134C, 0000,003C,0180,0A18,0182,134D    ;3026              FE_SC,SC_R[3]            ; PUT A OPERAND IN SC
U 134D, 0800,003C,0180,0A48,0000,119C    ;3027              D_R[9]
U 119C, 0000,193D,0180,0800,0000,10A0    ;3028      =0      CALL,D3-0?,J/EALUT2      ; GO TO THE ROUTINE WHICH SIMUALTES
                                         ;3029                                       ; EXECUTES AND CHECKS
                                         ;3030                                       ; THE RESULT OF THIS
                                         ;3031                                       ; FUNCTION WITH THESE OPERANDS.
U 119D, 0018,0000,0580,0AB8,0010,134E    ;3032              R[7]_LA-K[.1],CLK.UBCC   ; HAVE ALL THE B OPERAND
U 134E, 0000,013C,0180,0800,0000,119E    ;3033              Z?                       ; VALUES BEEN TRIED?
U 119E, 0000,003C,0180,0A20,0000,134F    ;3034      =0      LAB_R[4],J/EALU4         ; IF NOT INCRMENT AND CONTINUE
U 119F, 0000,003C,0180,0A30,0000,1350    ;3035              LAB_R[6],J/EALU5         ; ELSE CHECK A OPERAND.
U 134F, 0018,0014,0580,0AA0,0000,134B    ;3036      EALU4:  R[4]_LA+K[.1],J/EALU3
U 1350, 0018,0000,0580,0AB0,0010,1351    ;3037      EALU5:  R[6]_LA-K[.1],CLK.UBCC   ; HAVE ALL A OPERAND VALUES
U 1351, 0000,013C,0180,0800,0000,11A0    ;3038              Z?                       ; TRIED?
U 11A0, 0000,003C,0180,0A18,0000,1352    ;3039      =0      LAB_R[3],J/EALU6         ; IF NOT INCREMENT AND CONTINUE
U 11A1, 0000,003C,0180,0800,0000,1353    ;3040              J/EALU10
U 1352, 0018,0014,0580,0A98,0000,1348    ;3041      EALU6:  R[3]_LA+K[.1],J/EALU2
                                         ;3042      ; TEST EALU<07:04>
U 1353, 0018,0038,0180,0AA8,0000,1354    ;3043      EALU10: R[5]_K[.8]               ; SET UP THE OPERAND INCREMENT
U 1354, 0018,0038,7580,0AF0,0000,1355    ;3044              R[0E]_K[.20]             ; SET UP THE OPERAND COUNT
U 1355, 0003,003C,0180,0A98,0000,1356    ;3045      EALU11: R[3]_0                   ; INITIALIZE THE A OPERAND
U 1356, 0000,003C,0180,0A70,0000,1357    ;3046              LAB_R[0E]                ; AND COUNTER
U 1357, 0000,003C,0180,0AB0,0000,1358    ;3047              R[6]_LA
U 1358, 0003,003C,0180,0AA0,0000,1359    ;3048      EALU12: R[4]_0                   ; INITIALIZE THE B OPERAND
U 1359, 0000,003C,0180,0A70,0000,135A    ;3049              LAB_R[0E]                ; AND COUNTER
U 135A, 0000,003C,0180,0AB8,0000,135B    ;3050              R[7]_LA
U 135B, 0000,003C,0180,0A20,0082,135C    ;3051      EALU13: SC_R[4]                  ; PUT B OPERAND IN FE
U 135C, 0000,003C,0180,0A18,0182,135D    ;3052              FE_SC,SC_R[3]            ; PUT A OPERAND IN SC
U 135D, 0800,003C,0180,0A48,0000,11A2    ;3053              D_R[9]
U 11A2, 0000,193D,0180,0800,0000,10A0    ;3054      =0      CALL,D3-0?,J/EALUT2      ; EXECUTE AND CHECK THE FUNCTION
                                         ;3055                                       ; WITH THESE OPERANDS
U 11A3, 0018,0000,0580,0AB8,0010,135E    ;3056              R[7]_LA-K[.1],CLK.UBCC   ; HAVE ALL B OPERANDS BEEN TRIED
U 135E, 0000,013C,0180,0800,0000,11A4    ;3057              Z?
U 11A4, 0800,003C,0180,0A20,0000,135F    ;3058      =0      D_R[4],J/EALU14          ; IF NOT INCREMENT AND CONTINUE
U 11A5, 0000,003C,0180,0A30,0000,1361    ;3059              LAB_R[6],J/EALU15        ; OTHERWISE CHECK A OPERAND
U 135F, 0000,003C,0180,0A28,0000,1360    ;3060      EALU14: LAB_R[5]
U 1360, 001C,2014,0180,0AA0,0000,135B    ;3061              ALU_LA[A+B]D,R[4]_ALU,J/EALU13
U 1361, 0018,0000,0580,0AB0,0010,1362    ;3062      EALU15: R[6]_LA-K[.1],CLK.UBCC   ; HAVE ALL A OPERANDS BEEN TRIED
U 1362, 0000,013C,0180,0800,0000,11A6    ;3063              Z?
U 11A6, 0800,003C,0180,0A18,0000,1363    ;3064      =0      D_R[3],J/EALU16          ; IF NOT INCREMENT AND CONTINUE
U 11A7, 0F00,003C,0180,0800,0000,1365    ;3065              D_0,J/EALU20
U 1363, 0000,003C,0180,0A28,0000,1364    ;3066      EALU16: LAB_R[5]
U 1364, 001C,2014,0180,0A98,0000,1358    ;3067              ALU_LA[A+B]D,R[3]_ALU,J/EALU12
                                         ;3068      ; TEST EALU<09:08>
U 1365, 0800,003C,0180,0A28,0000,11A8    ;3069      EALU20: D_R[5]                   ; SET UP THE OPERANDS INCREMENT
U 11A8, 0001,003D,0180,0AF0,0000,1010    ;3070      =0      R[0E]_D,CALL,J/DC0
U 11A9, 0001,003C,0180,0AA8,0000,1366    ;3071              R[5]_D
U 1366, 0003,003C,0180,0A98,0000,1367    ;3072      EALU21: R[3]_0                   ; INITIALIZE THE A OPERAND
U 1367, 0000,003C,0180,0A70,0000,1368    ;3073              LAB_R[0E]                ; AND COUNTER
U 1368, 0000,003C,0180,0AB0,0000,1369    ;3074              R[6]_LA
```

```
U 1369, 0003,003C,0180,0AA0,0000,136A    ;3075   EALU22: R[4]_0                  ; INITIALIZE THE BOPERAND
U 136A, 0000,003C,0180,0A70,0000,136B    ;3076           LAB_R[0E]               ; AND COUNTER
U 136B, 0000,003C,0180,0AB8,0000,136C    ;3077           R[7]_LA
U 136C, 0000,003C,0180,0A20,0082,136D    ;3078   EALU23: SC_R[4]                 ; PUT B OPERAND IN FE
U 136D, 0000,003C,0180,0A18,0182,136E    ;3079           FE_SC,SC_R[3]           ; PUT A OPERAND IN SC
U 136E, 0800,003C,0180,0A48,0000,11AA    ;3080           D_R[9]
U 11AA, 0000,193D,0180,0800,0000,10A0    ;3081   =0      CALL,D3-0?,J/EALUT2     ; GO EXECUTE AND CHECK THE
                                         ;3082                                   ; FUNCTION WITH THESE OPERANDS.
U 11AB, 0018,0000,0580,0AB8,0010,136F    ;3083           R[7]_LA-K[.1],CLK.UBCC  ; HAVE ALL B OPERANDS BEEN TRIED?
U 136F, 0000,013C,0180,0800,0000,11AC    ;3084           Z?
U 11AC, 0800,003C,0180,0A20,0000,1370    ;3085   =0      D_R[4],J/EALU24         ; IF NOT INCREMENT AND CONTINUE
U 11AD, 0000,003C,0180,0A30,0000,1372    ;3086           LAB_R[6],J/EALU25       ; ELSE CHECK A OPERAND
U 1370, 0000,003C,0180,0A28,0000,1371    ;3087   EALU24: LAB_R[5]
U 1371, 001C,2014,0180,0AA0,0000,136C    ;3088           ALU_LA[A+B]D,R[4]_ALU,J/EALU23
U 1372, 0018,0000,0580,0AB0,0010,1373    ;3089   EALU25: R[6]_LA-K[.1],CLK.UBCC  ; HAVE ALL A OPERANDS BEEN TRIED?
U 1373, 0000,013C,0180,0800,0000,11AE    ;3090           Z?
U 11AE, 0800,003C,0180,0A18,0000,1375    ;3091   =0      D_R[3],J/EALU26         ; IF NOT INCREMENT AND CONTINUE
U 11AF, 0000,003C,0180,0A48,0010,1374    ;3092           ALU_R[9],CLK.UBCC       ; SEE IF ALL FUNCTIONS HAVE
U 1374, 0000,013C,0180,0800,0000,11B0    ;3093           Z?,J/EALU27             ; BEEN TESTED.
U 1375, 0000,003C,0180,0A28,0000,1376    ;3094   EALU26: LAB_R[5]
U 1376, 001C,2014,0180,0A98,0000,1369    ;3095           ALU_LA[A+B]D,R[3]_ALU,J/EALU22
                                         ;3096   =0
U 11B0, 0018,0000,0580,0AC8,0000,1198    ;3097   EALU27: R[9]_LA-K[.1],J/EALU1   ; IF ALL FUNCTIONS HAVE NOT BEEN
                                         ;3098                                   ; TESTED THEN DECREMENT COUNTER
                                         ;3099                                   ; AND CONTINUE
U 11B1, 0000,003C,0180,0800,0000,13B6    ;3100           J/EALU100               ; ELSE DONE!
                                         ;3101   ;////////////////////////////////////////////////////////
                                         ;3102   ;+
                                         ;3103   ; SUBTEST       1
                                         ;3104   ; EALU/A
                                         ;3105   ;-
                                         ;3106   =0
U 11B2, 0000,003D,0180,0800,0000,111C    ;3107   EALUL1: ERLOOP
U 11B3, 0800,003C,0180,0A78,0000,1377    ;3108           D_R[0F]                 ; SEE IF THIS CALL WAS
U 1377, 0000,0D3C,0180,0800,0000,10DD    ;3109           SIGNS?                  ; TO SET THE LOOP ON ERROR
U 10DD, 0018,003A,C180,0AF8,0000,0001    ;3110   =101    ALU_K[.FFFF],R[0F]_ALU,RETURN1 ; ADDRESS
                                         ;3111                                   ; OR DID AN ERROR OCCUR
                                         ;3112                                   ; WITH THE LOOP ON ERROR FLAG SET
U 10DF, 0000,003C,01C0,0A18,0000,1378    ;3113           Q_R[3]
U 1378, 0000,003C,0180,0A68,0000,1379    ;3114   EALUX1: LAB_R[0D]               ; COMPUTE EXPECTED RESULT.
U 1379, 001C,0034,01C0,0A88,0000,137A    ;3115           ALU_LA[AND]Q,R[1]_ALU,Q_ALU
U 137A, 0000,003C,0180,0800,0080,137B    ;3116           EBMX/FE,EALU/A,SC_EALU  ; TEST INSTRUCTION
U 137B, 0818,0038,1D80,0A90,0000,137C    ;3117           D_SC,R[2]_ALU           ; GET ACTUAL RESULT
U 137C, 001D,2000,0180,0800,0010,137D    ;3118           ALU_Q-D,CLK.UBCC        : WAS IT CORRECT?
U 137D, 0000,013C,0180,0800,0000,11B4    ;3119           Z?
U 11B4, 0000,003C,0180,0800,0000,13AC    ;3120   =0      J/EALUER                ; GO REPORT THE ERROR.
U 11B5, 0000,003E,0180,0A38,0000,0001    ;3121           LAB_R[7],RETURN1
                                         ;3122   ;////////////////////////////////////////////////////////
                                         ;3123   ;+
                                         ;3124   ; SUBTEST       2
                                         ;3125   ; EALU/B
                                         ;3126   ;-
                                         ;3127   =0
U 11B6, 0000,003D,0180,0800,0000,111C    ;3128   EALUL2: ERLOOP
U 11B7, 0800,003C,0180,0A78,0000,137E    ;3129           D_R[0F]                 ; SEE IF THIS CALL WAS
```

```
U 137E, 0000,0D3C,0180,0800,0000,10E5    ;3130             SIGNS?                    ; TO SET THE LOOP ON ERROR
U 10E5, 0018,003A,C180,0AF8,0000,0001    ;3131    =101     ALU_K[.FFFF],R[OF]_ALU,RETURN1 ; ADDRESS
                                         ;3132                                       ; OR DID AN ERROR OCCUR
                                         ;3133                                       ; WITH THE LOOP ON ERROR FLAG SET
U 10E7, 0000,003C,01C0,0A20,0000,137F    ;3134             Q_R[4]
U 137F, 0000,003C,0180,0A68,0000,1380    ;3135    EALUX2: LAB_R[OD]                  ; COMPUTE THE EXPECTED RESULT.
U 1380, 001C,0034,01C0,0A88,0000,1381    ;3136             ALU_LA[AND]Q,R[1]_ALU,Q_ALU
U 1381, 0000,003C,0180,0800,0080,7382    ;3137             EBMX/FE,EALU/B,SC_EALU   ; TEST INSTRUCTION
U 1382, 0818,0038,1D80,0A90,0000,1383    ;3138             D_SC,R[2]_ALU            ; GET THE ACTUAL RESULT
U 1383, 001D,2000,0180,0800,0010,1384    ;3139             ALU_Q-D,CLK.UBCC         ; WAS IT CORRECT
U 1384, 0000,013C,0180,0800,0000,11B8    ;3140             Z?
U 11B8, 0000,003C,0180,0800,0000,13AC    ;3141    =0       J/EALUER                 ; REPORT ERROR
U 11B9, 0000,003E,0180,0A38,0000,0001    ;3142             LAB_R[7],RETURN1
                                         ;3143    ;/////////////////////////////////////////////////////////////////
                                         ;3144    ;+
                                         ;3145    ; SUBTEST      3
                                         ;3146    ; EALU/A.OR.B
                                         ;3147    ;-
                                         ;3148    =0
U 11BA, 0000,003D,0180,0800,0000,111C    ;3149    EALUL3: ERLOOP
U 11BB, 0800,003C,0180,0A78,0000,1385    ;3150             D_R[OF]                  ; SEE IF THIS CALL WAS
U 1385, 0000,0D3C,0180,0800,0000,10ED    ;3151             SIGNS?                   ; TO SET THE LOOP ON ERROR
U 10ED, 0018,003A,C180,0AF8,0000,0001    ;3152    =101     ALU_K[.FFFF],R[OF]_ALU,RETURN1 ; ADDRESS
                                         ;3153                                       ; OR DID AN ERROR OCCUR
                                         ;3154                                       ; WITH THE LOOP ON ERROR FLAG SET
U 10EF, 0000,003C,01C0,0A18,0000,1386    ;3155             Q_R[3]
U 1386, 0000,003C,0180,0A20,0000,1387    ;3156    EALUX3: LAB_R[4]                   ; COMPUTE EXPECTED RESULT
U 1387, 001C,0030,01C0,0A88,0000,1388    ;3157             ALU_LA[OR]Q,Q_ALU,R[1]_ALU
U 1388, 0000,003C,0180,0800,0080,3389    ;3158             EBMX/FE,EALU/OR,SC_EALU  ; TEST INSTRUCTION
U 1389, 0818,0038,1D80,0A90,0000,138A    ;3159             D_SC,R[2]_ALU            ; GET THE ACTUAL RESULT
U 138A, 001D,2000,0180,0800,0010,138B    ;3160             ALU_Q-D,CLK.UBCC         ; WAS IT CORRECT?
U 138B, 0000,013C,0180,0800,0000,11BC    ;3161             Z?
U 11BC, 0000,003C,0180,0800,0000,13AC    ;3162    =0       J/EALUER                 ; REPORT ERROR
U 11BD, 0000,003E,0180,0A38,0000,0001    ;3163             LAB_R[7],RETURN1
                                         ;3164    ;/////////////////////////////////////////////////////////////////
                                         ;3165    ;+
                                         ;3166    ; SUBTEST      4
                                         ;3167    ; EALU/A.ANDNOT.B
                                         ;3168    ;-
                                         ;3169    =0
U 11BE, 0000,003D,0180,0800,0000,111C    ;3170    EALUL4: ERLOOP
U 11BF, 0800,003C,0180,0A78,0000,138C    ;3171             D_R[OF]                  ; SEE IF THIS CALL WAS
U 138C, 0000,0D3C,0180,0800,0000,10F5    ;3172             SIGNS?                   ; TO SET THE LOOP ON ERROR
U 10F5, 0018,003A,C180,0AF8,0000,0001    ;3173    =101     ALU_K[.FFFF],R[OF]_ALU,RETURN1 ; ADDRESS
                                         ;3174                                       ; OR DID AN ERROR OCCUR
                                         ;3175                                       ; WITH THE LOOP ON ERROR FLAG SET
U 10F7, 0000,0028,01C0,0A20,0000,138D    ;3176             LAB_R[4],ALU_NOT.LA,Q_ALU
U 138D, 0000,003C,0180,0A18,0000,138E    ;3177    EALUX4: LAB_R[3]                   ; COMPUTE EXPECTED RESULT
U 138E, 001C,0034,01C0,0A88,0000,138F    ;3178             ALU_LA[AND]Q,Q_ALU,R[1]_ALU
U 138F, 0000,003C,0180,0800,0080,5390    ;3179             EBMX/FE,EALU/ANDNOT,SC_EALU ; TEST INSTRUCTION
U 1390, 0818,0038,1D80,0A90,0000,1391    ;3180             D_SC,R[2]_ALU            ; GET THE ACTUAL RESULT
U 1391, 001D,2000,0180,0800,0010,1392    ;3181             ALU_Q-D,CLK.UBCC         ; IS IT CORRECT?
U 1392, 0000,013C,0180,0800,0000,11C0    ;3182             Z?
U 11C0, 0000,003C,0180,0800,0000,13AC    ;3183    =0       J/EALUER                 ; REPORT ERROR
U 11C1, 0000,003E,0180,0A38,0000,0001    ;3184             LAB_R[7],RETURN1
```

```
                                        ;3185   ;//////////////////////////////////////////////////////////////
                                        ;3186   ;+
                                        ;3187   ; SUBTEST       5
                                        ;3188   ; EALU/A.PLUS.B
                                        ;3189   ;-
                                        ;3190   =0
U 11C2, 0000,003D,0180,0800,0000,111C   ;3191   EALUL5: ERLOOP
U 11C3, 0800,003C,0180,0A78,0000,1393   ;3192           D_R[OF]                 ; SEE IF THIS CALL WAS
U 1393, 0000,0D3C,0180,0800,0000,10FD   ;3193           SIGNS?                  ; TO SET THE LOOP ON ERROR
U 10FD, 0018,003A,C180,0AF8,0000,0001   ;3194   =101    ALU_K[.FFFF],R[OF]_ALU,RETURN1 ; ADDRESS
                                        ;3195                                   ; OR DID AN ERROR OCCUR
                                        ;3196                                   ; WITH THE LOOP ON ERROR FLAG SET
U 10FF, 0000,003C,01C0,0A18,0000,1394   ;3197           Q_R[3]
U 1394, 0000,003C,0180,0A20,0000,1395   ;3198   EALUX5: LAB_R[4]                ; COMPUTE THE EXPECTED RESULT
U 1395, 001C,0014,01C0,0800,0000,1396   ;3199           ALU_LA[A+B]Q,Q_ALU
U 1396, 001C,0034,01C0,0A68,0000,1397   ;3200           LAB_R[0D],ALU_[A[AND]Q,Q_ALU
U 1397, 0001,203C,0180,0A88,0000,1398   ;3201           R[1]_Q
U 1398, 0000,003C,0180,0800,0080,9399   ;3202           EBMX7FE,EALU/A+B,SC_EALU ; TEST INSTRUCTION
U 1399, 0818,0038,1D80,0A90,0000,139A   ;3203           D_SC,R[2]_ALU           ; GET THE ACTUAL RESULT
U 139A, 001D,2000,0180,0800,0010,139B   ;3204           A[U_Q-D,C[K.UBCC        ; IS IT CORRECT
U 139B, 0000,013C,0180,0800,0000,11C4   ;3205           Z?
U 11C4, 0000,003C,0180,0800,0000,13AC   ;3206   =0      J/EALUER                ; REPORT THE ERROR
U 11C5, 0000,003E,0180,0A38,0000,0001   ;3207           LAB_R[7],RETURN1
                                        ;3208   ;/////////7////////////////////////////////////////////////////
                                        ;3209   ;+
                                        ;3210   ; SUBTEST       6
                                        ;3211   ; EALU/A.MINUS.B
                                        ;3212   ;-
                                        ;3213   =0
U 11C6, 0000,003D,0180,0800,0000,111C   ;3214   EALUL6: ERLOOP
U 11C7, 0800,003C,0180,0A78,0000,139C   ;3215           D_R[OF]                 ; SEE IF THIS CALL WAS
U 139C, 0000,0D3C,0180,0800,0000,1115   ;3216           SIGNS?                  ; TO SET THE LOOP ON ERROR
U 1115, 0018,003A,C180,0AF8,0000,0001   ;3217   =101    ALU_K[.FFFF],R[OF]_ALU,RETURN1 ; ADDRESS
                                        ;3218                                   ; OR DID AN ERROR OCCUR
                                        ;3219                                   ; WITH THE LOOP ON ERROR FLAG SET
U 1117, 0000,003C,01C0,0A20,0000,139D   ;3220           Q_R[4]
U 139D, 0000,003C,0180,0A18,0000,139E   ;3221   EALUX6: LAB_R[3]                ; COMPUTE THE EXPECTED RESULT
U 139E, 001C,0000,01C0,0800,0000,139F   ;3222           ALU_LA[A-B]Q,Q_ALU
U 139F, 001C,0034,01C0,0A68,0000,13A0   ;3223           LAB_R[0D],ALU_[A[AND]Q,Q_ALU
U 13A0, 0001,203C,0180,0A88,0000,13A1   ;3224           R[1]_Q
U 13A1, 0000,003C,0180,0800,0080,B3A2   ;3225           EBMX7FE,EALU/A-B,SC_EALU ; TEST INSTRUCTION
U 13A2, 0818,0038,1D80,0A90,0000,13A3   ;3226           D_SC,R[2]_ALU           ; GET THE ACTUAL RESULT
U 13A3, 001D,2000,0180,0800,0010,13A4   ;3227           A[U_Q-D,C[K.UBCC        ; IS IT CORRECT?
U 13A4, 0000,013C,0180,0800,0000,11C8   ;3228           Z?
U 11C8, 0000,003C,0180,0800,0000,13AC   ;3229   =0      J/EALUER                ; REPORT THIS ERROR
U 11C9, 0000,003E,0180,0A38,0000,0001   ;3230           LAB_R[7],RETURN1
                                        ;3231   ;/////////7////////////////////////////////////////////////////
                                        ;3232   ;+
                                        ;3233   ; SUBTEST       7
                                        ;3234   ; EALU/A.PLUS.1
                                        ;3235   ;-
                                        ;3236   =0
U 11CA, 0000,003D,0180,0800,0000,111C   ;3237   EALUL7: ERLOOP
U 11CB, 0800,003C,0180,0A78,0000,13A5   ;3238           D_R[OF]                 ; SEE IF THIS CALL WAS
U 13A5, 0000,0D3C,0180,0800,0000,111D   ;3239           SIGNS?                  ; TO SET THE LOOP ON ERROR
```

```
U 111D, 0018,003A,C180,0AF8,0000,0001    =101    ALU_K[.FFFF],R[0F]_ALU,RETURN1 ; ADDRESS
                                                                       ; OR DID AN ERROR OCCUR
                                                                       ; WITH THE LOOP ON ERROR FLAG SET
U 111F, 0000,003C,01C0,0A18,0000,13A6            Q_R[3]
U 13A6, 0019,2014,05C0,0A68,0000,13A7    EALUX7: Q_Q+K[.1],LAB_R[0D]     ; COMPUTE THE EXPECTED RESULT
U 13A7, 001C,0034,01C0,0A88,0000,13A8            ALU_LA[AND]Q,Q_ALU,R[1]_ALU
U 13A8, 0000,003C,0180,0800,0080,D3A9            EBMX/FE,EALU/A+1,SC_EALU ; TEST INSTRUCTION
U 13A9, 0818,0038,1D80,0A90,0000,13AA            D_SC,R[2]_ALU           ; GET THE ACTUAL RESULT
U 13AA, 001D,2000,0180,0800,0010,13AB            ALU_Q-D,CLK.UBCC        ; IS IT CORRECT?
U 13AB, 0000,013C,0180,0800,0000,11CC            Z?
U 11CC, 0000,003C,0180,0800,0000,13AC    =0      J/EALUER                ; REPORT THIS ERROR
U 11CD, 0000,003E,0180,0A38,0000,0001            LAB_R[7],RETURN1
                                         ; WHEN AN ERROR IS DETECTED THE CONTENTS OF THE FOLLOWING
                                         ; RC SCRATCH PADS ARE TYPED:
                                         ;
                                         ;       RC[0E] = EXPECTED RESULT
                                         ;       RC[0D] = GOT RESULT
                                         ;       RC[0C] = A OPERAND (FROM SC)
                                         ;       RC[0B] = B OPERAND (FROM FE)
                                         ;       RC[0A] = EALU FUNCTION AS SHOWN BELOW
                                         ;
                                         ;       6       A
                                         ;       5       B
                                         ;       4       A.OR.B
                                         ;       3       A.AND.NOT.B
                                         ;       2       A.PLUS.B
                                         ;       1       A.MINUS.B
                                         ;       0       A.PLUS.1
                                         ;
U 13AC, 0000,003C,0180,0A08,0000,13AD    EALUER: LAB_R[1]
U 13AD, 0000,003C,0180,09F0,0000,13AE            RC[0E]_LA
U 13AE, 0000,003C,0180,0A10,0000,13AF            LAB_R[2]
U 13AF, 0000,003C,0180,09E8,0000,13B0            RC[0D]_LA
U 13B0, 0000,003C,0180,0A18,0000,13B1            LAB_R[3]
U 13B1, 0000,003C,0180,09E0,0000,13B2            RC[0C]_LA
U 13B2, 0000,003C,0180,0A20,0000,13B3            LAB_R[4]
U 13B3, 0000,003C,0180,09D8,0000,13B4            RC[0B]_LA
U 13B4, 0000,003C,0180,0A48,0000,13B5            LAB_R[9]
U 13B5, 0000,003D,0180,09D0,0000,111E            RC[0A]_LA,ERROR1
                                         ; THIS TABLE IS USED TO SET THE LOOP ON ERROR ADDRESS
                                         ; FOR EACH FUNCTION:
                                         =0000
U 1090, 0000,003C,0180,0800,0000,11CA    EALUT1: J/EALUL7
U 1091, 0000,003C,0180,0800,0000,11C6            J/EALUL6
U 1092, 0000,003C,0180,0800,0000,11C2            J/EALUL5
U 1093, 0000,003C,0180,0800,0000,11BE            J/EALUL4
U 1094, 0000,003C,0180,0800,0000,11BA            J/EALUL3
U 1095, 0000,003C,0180,0800,0000,11B6            J/EALUL2
U 1096, 0000,003C,0180,0800,0000,11B2            J/EALUL1
                                         =
                                         ; THIS TABLE IS USED TO INDEX TO THE ROUTINES THAT EXECUTE
                                         ; CHECK THE RESULT OF EACH FUNCTION TESTED:
                                         =0000
U 10A0, 0000,003C,01C0,0A18,0000,13A6    EALUT2: Q_R[3],J/EALUX7
U 10A1, 0000,003C,01C0,0A20,0000,139D            Q_R[4],J/EALUX6
```

```
U 10A2, 0000,003C,01C0,0A18,0000,1394   ;3295           Q_R[3],J/EALUX5
U 10A3, 0000,0028,01C0,0A20,0000,138D   ;3296           LAB_R[4],ALU_NOT.LA,Q_ALU,J/EALUX4
U 10A4, 0000,003C,01C0,0A18,0000,1386   ;3297           Q_R[3],J/EALUX3
U 10A5, 0000,003C,01C0,0A20,0000,137F   ;3298           Q_R[4],J/EALUX2
U 10A6, 0000,003C,01C0,0A18,0000,1378   ;3299           Q_R[3],J/EALUX1
                                        ;3300   =
U 13B6, 0000,003C,0180,0800,0000,11CE   ;3301   EALU100:        NOP
```

```
                                                .PAGE   "TEST 6D        EALU/NABS.A-B TEST"
                                        ;*************************************************************
                                        ;++
                                        ; TEST  6D      EALU/NABS.A-B TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF THE EALU FUNCTION THAT
                                        ;       COMPUTES THE NEGATIVE ABSOLUTE VALUE OF THE
                                        ;       A-B. NOTE THAT NOT ALL THE ROM LOCATIONS
                                        ;       USED TO DO THIS FUNCTION ARE TESTED HERE. RATHER THIS IS
                                        ;       A TEST OF THE CONTROL LOGIC INVOLVED.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED RESULT
                                        ;       ACTUAL RESULT
                                        ;
                                        ;--
                                        ;*************************************************************
                                        =0
U 11CE, 0000,003D,0180,0800,0000,10B2   ABS2:   NEWTST
U 11CF, 0018,0038,0980,09F8,0000,13B7           RC[0F]_K[.2]
U 13B7, 0F00,003C,0180,0800,0000,11D0           D_0                     ; GENERATE SOME CONSTANTS
U 11D0, 0000,003D,0180,0800,0000,101A   =0      CALL,J/DCA
U 11D1, 0018,0038,C180,0800,0000,13B8           ALU_K[.FFFF]
U 13B8, 0500,003C,0380,0800,0000,11D2           D_D.LEFT,SI/7
U 11D2, 0000,003D,0180,0800,0000,1015   =0      CALL,J/DC5
U 11D3, 0001,003C,0180,0A98,0082,11D4           ALU_D,SC_ALU,R[3]_ALU   ; R[3]=SC=155
U 11D4, 0F00,003D,0180,0800,0000,1019   =0      D_0,CALL,J/DC9
U 11D5, 0018,0038,C180,0800,0100,13B9           EALU/A,FEK/LOAD,ALU_K[.FFFF] ; FE=155
U 13B9, 0500,003C,0380,0800,0000,11D6           D_D.LEFT,SI/7
U 11D6, 0500,003D,0180,0800,0000,1018   =0      D_D.LEFT,SI/ZERO,CALL,J/DC8
U 11D7, 0001,003C,0180,0AA0,0082,13BA           ALU_D,SC_ALU,R[4]_ALU   ; R[4]=SC=268
U 13BA, 0000,003C,0180,0800,0080,F3BB           EBMX/FE,EALU/NABS.A-B,SC_EALU ; TEST INSTR, SC=NABS(68-55)=NABS(13)=3ED
U 13BB, 0000,003C,0180,0800,0000,11D8           NOP
U 11D8, 0F00,003D,0180,0800,0000,101F   =0      D_0,CALL,J/DCF          ; GENERATE THE EXPECTED RESULT
U 11D9, 0018,0038,C180,0800,0000,13BC           ALU_K[.FFFF]
U 13BC, 0500,003C,0380,0800,0000,11DA           D_D.LEFT,SI/7
U 11DA, 0500,003D,0180,0800,0000,101D   =0      D_D.LEFT,SI/ZERO,CALL,J/DCD
U 11DB, 0001,003C,01C0,09F0,0000,13BD           ALU_D,RC[0E]_ALU,Q_ALU  ; RESULT SHOULD BE 3ED
U 13BD, 0818,0038,1D80,09E8,0000,13BE           D_SC,RC[0D]_ALU
U 13BE, 001D,2000,0180,0800,0010,13BF           ALU_Q-D,CLK.UBCC        ; CHECK THE RESULT
U 13BF, 0000,013C,0180,0800,0000,11DC           Z?
U 11DC, 0000,003D,0180,0800,0000,111E   =0      ERROR1                  ; RESULT INCORRECT
U 11DD, 0000,003C,0180,0800,0000,11DE           NOP
```

```
                                         ;3348          .PAGE   "TEST 6E        EALU/NABS.A-B ROM TEST"
                                         ;3349  ;*****************************************************************
                                         ;3350  ;++
                                         ;3351  ; TEST  6E      EALU/NABS.A-B ROM TEST
                                         ;3352  ;
                                         ;3353  ; TEST DESCRIPTION
                                         ;3354  ;       THIS IS A TEST OF THE ROM USED TO COMPUTE THE NEGATIVE
                                         ;3355  ;       ABSOLUTE VALUE OF THE A-B. EVERY LOCATION IN THIS
                                         ;3356  ;       ROM IS TESTED.
                                         ;3357  ;       NOTE THAT THIS TEST IS CONDUCTED BY SUBTRACTING
                                         ;3358  ;       ZERO FROM THE OPERAND WHOSE NEGATIVE ABSOLUTE
                                         ;3359  ;       VALUE IS TO BE TAKEN.
                                         ;3360  ;
                                         ;3361  ; LOGIC DESCRIPTION
                                         ;3362  ;
                                         ;3363  ; ERROR DESCRIPTION
                                         ;3364  ;       EXPECTED RESULT
                                         ;3365  ;       GOT RESULT
                                         ;3366  ;
                                         ;3367  ;--
                                         ;3368  ;*****************************************************************
                                         ;3369  =0
U 11DE, 0000,003D,0180,0800,0000,10B2    ;3370  ABS:    NEWTST
U 11DF, 0018,0038,0980,09F8,0000,13C0    ;3371          RC[0F]_K[.2]
U 13C0, 0F18,0038,1980,0A98,0082,11E0    ;3372          ALU_0(K),R[3]_ALU,SC_ALU,D_0 ; INITIALIZE SOMF CONSTANTS
U 11E0, 0000,003D,0180,0800,0100,1018    ;3373  =0      EALU/A,FEK/LOAD,CALL,J/DC8 ; FE=80
U 11E1, 0100,003C,0180,0800,0000,13C1    ;3374          D_D.LEFT2,SI/ZERO
U 13C1, 0100,003C,0180,0800,0000,13C2    ;3375          D_D.LEFT2,SI/ZERO
U 13C2, 0001,003C,0180,0AA8,0000,13C3    ;3376          R[5]_D                  ; R[5]=80
U 13C3, 0001,003C,0180,0AB0,0000,11E2    ;3377          R[6]_D                  ; R[6]=80
U 11E2, 0F00,003D,0180,0800,0000,101F    ;3378  =0      D_0,CALL,J/DCF
U 11E3, 0000,003C,0180,0800,0000,11E4    ;3379          NOP
U 11E4, 0000,003D,0180,0800,0000,101F    ;3380  =0      CALL,J/DCF
U 11E5, 0001,0028,0180,0AA0,0000,11E6    ;3381          ALU_NOT.D,R[4]_ALU      ; R[4]=FFFFFF00
U 11E6, 0F00,003D,0180,0800,0000,101C    ;3382  =0      D_0,CALL,J/DCC
U 11E7, 0100,003C,0180,0800,0000,11E8    ;3383          D_D.LEFT2,SI/ZERO
U 11E8, 0100,003C,0180,0800,0000,11E9    ;3384  =0      D_D.LEFT2,SI/ZERO
U 11E9, 0100,003C,0180,0800,0000,13C4    ;3385          D_D.LEFT2,SI/ZERO
U 13C4, 0001,003C,0180,0AB8,0000,11EA    ;3386          R[7]_D                  ; R[7]=300
U 11EA, 0000,003D,0180,0800,0000,111C    ;3387  =0      ERLOOP
U 11EB, 0800,003C,0180,0A18,0082,13C5    ;3388  ABS1:   LAB_R[3],AMX/LA,ALU/A,SC_ALU,D_ALU ; LOADPOSITIVE DATA PATTERN INTO SC
U 13C5, 0000,003C,01C0,0A20,0080,F3C6    ;3389          EBMX/FE,EALU/NABS.A-B,SC_EALU,Q_R[4] ; TEST INSTR, EALU=NABS(0+POSITIVE DATA
U 13C6, 081F,2000,0180,0800,0000,13C7    ;3390          D_0-D                   ; COMPUTE EXPECTED RESULT
U 13C7, 081D,0024,0180,0A38,0000,13C8    ;3391          ALU_D[ANDNOT]Q,D_ALU,LAB_R[7]
U 13C8, 001C,2030,01C0,09F0,0000,13C9    ;3392          ALU_LA[OR]D,Q_ALU,RC[0E]_ALU
U 13C9, 0818,0038,1D80,09E8,0000,13CA    ;3393          D_SC,RC[0D]_ALU         ; GET ACTUAL RESULT LEFT IN SC
U 13CA, 001D,2000,0180,0800,0010,13CB    ;3394          ALU_Q-D,CLK_UBCC        ; CHECK THE RESULT
U 13CB, 0000,013C,0180,0800,0000,11EC    ;3395          Z?
U 11EC, 0000,003D,0180,0800,0000,111E    ;3396  =0      ERROR1                  ; RESULT INCORRECT WHEN NABS ROM
                                         ;3397                                  ; SHOULD HAVE BEEN ENABLED
U 11ED, 0000,003C,0180,0800,0080,F3CC    ;3398          EBMX/FE,EALU/NABS.A-B,SC_EALU ; TEST INSTR, EALU=NABS(0+NEGATIVE DATA)
U 13CC, 0818,0038,1D80,09E8,0000,13CD    ;3399          D_SC,RC[0D]_ALU         ; GET THE RESULT
U 13CD, 001D,2000,0180,0A18,0010,13CE    ;3400          ALU_Q-D,CLK_UBCC,LAB_R[3] ; CHECK THE RESULT
U 13CE, 0000,013C,0180,0800,0000,11EE    ;3401          Z?
U 11EE, 0000,003D,0180,0800,0000,111E    ;3402  =0      ERROR1                  ; RESULT INCORRECT WHEN NABS ROM
```

```
                                        ;3403                              ; SHOULD NOT HAVE BEEN ENABLED
U 11EF, 0018,0014,0580,0A98,0000,13CF   ;3404             R[3]_LA+K[.1]
U 13CF, 0000,003C,0180,0A28,0000,13D0   ;3405             LAB_R[5]
U 13D0, 0018,0000,0580,0AA8,0010,13D1   ;3406             R[5]_LA-K[.1],CLK.UBCC   ; TRIED ALL PATTERNS?
U 13D1, 0000,013C,0180,0800,0000,11F0   ;3407             Z?
U 11F0, 0000,003C,0180,0800,0000,11EB   ;3408    =0       J/ABS1                   ; IF NOT CONTINUE
U 11F1, 0000,003C,0180,0800,0000,11F2   ;3409             NOP
                                        ;3410    =0
U 11F2, 0000,003D,0180,0800,0000,10B2   ;3411    DUMMY1:  NEWTST
```

```
;                              Location / Line Number Index

;Location          0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - OFFF Unused
U 1000            1871:    1838     1839     2241=    1845=    1861=    1840     2242=
U 1008            1862=    1863=    1972=    1973=    1841     2244=    1842     2245=
U 1010            1953=    1954=    1955=    1956=    1957=    1958=    1959=    1960=
U 1018            1961=    1962=    1963=    1964=    1965=    1966=    1967=    1968=
U 1020            2001=    2002=    2003=    2004=    2005=    2006=    2007=    2008=
U 1028            2009=    2010=    2011=    2012=    2013=    2014=    2015=    2016=
U 1030            2046=    2047=    2048=    2049=    2050=    2051=    2052=    2053=
U 1038            2054=    2055=    2056=    2057=    2058=    2059=    2060=    2061=
U 1040            1975=    1976=    1843     2247=    2018=    2019=    1844     2248=
U 1048            2022=    2023=    2034=    2035=    1864     2286=    1902:    2287=
U 1050            2120=    2121=    2123=    2124=    1865     2250=    1866     2251=
U 1058            2126=    2127=    1905:    2289=    2131=    2132=    1908:    2290=
U 1060            2064=    2065=    2066=    2067=    2068=    2069=    2070=    2071=
U 1068            2072=    2073=    2074=    2075=    2076=    2077=    2078=    2079=
U 1070            2083=    2084=    2085=    2086=    2087=    2088=    2089=    2090=
U 1078            2091=    2092=    2093=    2094=    2095=    2096=    2097=    2098=
U 1080            2101=    2102=    2103=    2104=    2105=    2106=    2107=    2108=
U 1088            2109=    2110=    2111=    2112=    2113=    2114=    2115=    2116=
U 1090            3282=    3283=    3284=    3285=    3286=    3287=    3288=    1867
U 1098            2134=    2135=    2137=    2138=    2163=    2164=    2253=    2254=
U 10A0            3293=    3294=    3295=    3296=    3297=    3298=    3299=    1868
U 10A8            2166=    2167=    1869     2346=    2169=    2170=    1870     2347=
U 10B0            2171=    2172=    1880     2349=    2177=    2178=    1881     2350=
U 10B8            2190=    2191=    2201=    2202=    1882     2357=    1883     2358=
U 10C0            2207=    2208=    2236=    2237=    1884     2360=    1885     2361=
U 10C8            2238=    2239=    2279=    2280=    2283=    2284=    2367=    2368=
U 10D0            2292=    2294=    2320=    2321=    2323=    2324=    2370=    2371=
U 10D8            2325=    2326=    2327=    2328=    1886     3110=    1887     3113=
U 10E0            2329=    2330=    2331=    2332=    1888     3131=    1889     3134=
U 10E8            2334=    2335=    2336=    2337=    1890     3152=    1891     3155=
U 10F0            2339=    2340=    2344=    2345=    1892     3173=    1893     3176=
U 10F8            2354=    2355=    2365=    2366=    1894     3194=    1895     3197=
U 1100            1825:    1826:    1827:    1828:    1829:    1830:    1831:    1832:
U 1108            1833:    1896     2374=    2375=    1834:    1835:    1836:     337:
U 1110            2395=    2396=    2398=    2399=    1897     3217=    1898     3220=
U 1118            2401=    2402=    2407=    2408=    1899     3240=    1900     3243=
U 1120            2410=    2411=    2432=    2433=    2434=    2435=    2438=    2439=
U 1128            2446=    2447=    2454=    2455=    2458=    2459=    2487=    2488=
U 1130            2495=    2496=    2498=    2499=    2502=    2503=    2512=    2513=
U 1138            2524=    2525=    2546=    2547=    2551=    2552=    2563=    2564=
U 1140            2584=    2585=    2588=    2589=    2615=    2616=    2619=    2620=
U 1148            2622=    2623=    2630=    2631=    2638=    2639=    2642=    2643=
U 1150            2665=    2666=    2669=    2670=    1901     1928:    2672=    2673=
U 1158            2680=    2681=    2688=    2689=    2692=    2693=    2716=    2717=
U 1160            2720=    2721=    2723=    2724=    2730=    2731=    2737=    2738=
U 1168            2741=    2742=    2764=    2765=    2768=    2769=    2771=    2772=
U 1170            2779=    2780=    2787=    2788=    2791=    2792=    2813=    2814=
U 1178            2817=    2818=    2820=    2821=    2828=    2830=    2837=    2838=
U 1180            2841=    2842=    2864=    2865=    2870=    2871=    2881=    2882=
U 1188            2892=    2893=    2896=    2897=    2926=    2927=    2931=    2932=
U 1190            2943=    2944=    2957=    2958=    2961=    2962=    3008=    3009=
U 1198            3013=    3014=    3017=    3018=    3028=    3032=    3034=    3035=
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0           3039=   3040=   3054=   3056=   3058=   3059=   3064=   3065=
U 11A8           3070=   3071=   3081=   3083=   3085=   3086=   3091=   3092=
U 11B0           3097=   3100=   3107=   3108=   3120=   3121=   3128=   3129=
U 11B8           3141=   3142=   3149=   3150=   3162=   3163=   3170=   3171=
U 11C0           3183=   3184=   3191=   3192=   3206=   3207=   3214=   3215=
U 11C8           3229=   3230=   3237=   3238=   3250=   3251=   3323=   3324=
U 11D0           3326=   3327=   3329=   3330=   3331=   3332=   3334=   3335=
U 11D8           3338=   3339=   3341=   3342=   3346=   3347=   3370=   3371=
U 11E0           3373=   3374=   3378=   3379=   3380=   3381=   3382=   3383=
U 11E8           3384=   3385=   3387=   3388=   3396=   3398=   3402=   3404=
U 11F0           3408=   3409=   3411=   1903    1904    1936    1937    1943
U 11F8           1944    1945    1948    1949    1950    1951    1969    1970
U 1200           1974    1977    1978    1979    1980    1981    1982    1983
U 1208           1984    1985    1986    1987    1988    1989    1990    1991
U 1210           1992    1993    1994    1995    1996    2017    2024    2025
U 1218           2026    2027    2028    2029    2030    2031    2036    2037
U 1220           2038    2039    2040    2041    2042    2043    2125    2136
U 1228           2165    2168    2173    2174    2175    2176    2179    2180
U 1230           2185    2186    2187    2188    2189    2193    2194    2196
U 1238           2197    2198    2199    2200    2203    2204    2205    2206
U 1240           2240    2243    2246    2249    2252    2255    2281    2282
U 1248           2285    2288    2291    2322    2333    2338    2341    2342
U 1250           2343    2351    2352    2353    2362    2363    2364    2372
U 1258           2373    2397    2400    2403    2405    2406    2409    2436
U 1260           2437    2440    2441    2442    2443    2444    2445    2448
U 1268           2449    2450    2451    2452    2453    2456    2457    2460
U 1270           2461    2462    2463    2489    2490    2491    2492    2493
U 1278           2494    2497    2500    2501    2504    2505    2506    2507
U 1280           2508    2509    2510    2511    2514    2515    2516    2517
U 1288           2518    2519    2520    2521    2522    2523    2526    2527
U 1290           2528    2529    2530    2531    2532    2533    2534    2535
U 1298           2536    2537    2538    2539    2540    2541    2542    2543
U 12A0           2544    2545    2548    2549    2550    2562    2565    2566
U 12A8           2567    2568    1929:   2569    2570    2571    2572    2573
U 12B0           2580    2581    2582    2583    2586    2587    2590    2591
U 12B8           2592    2617    2618    2621    2624    2625    2626    2627
U 12C0           2628    2629    2632    2633    2634    2635    2636    2637
U 12C8           2640    2641    2644    2645    2667    2668    2671    2674
U 12D0           2675    2676    2677    2678    2679    2682    2683    2684
U 12D8           2685    2686    2687    2690    2691    2694    2695    2718
U 12E0           2719    2722    2725    2726    2727    2728    2729    2732
U 12E8           2733    2734    2735    2736    2739    2740    2743    2744
U 12F0           2766    2767    2770    2773    2774    2775    2776    2777
U 12F8           2778    2781    2782    2783    2784    2785    2786    2789
U 1300           2790    2793    2794    2815    2816    2819    2822    2824
U 1308           2825    2826    2827    2831    2833    2834    2835    2836
U 1310           2839    2840    2843    2844    2866    2867    2868    2869
U 1318           2872    2873    2875    2876    2877    2878    2879    2880
U 1320           2883    2884    2886    2887    2888    2889    2890    2891
U 1328           2894    2895    2898    2899    2900    2901    2928    2929
U 1330           2930    2934    2935    2939    2940    2941    2942    2945
U 1338           2946    2952    2953    2954    2955    2956    2959    2960
U 1340           2963    2964    3010    3011    3015    3016    3019    3020
```

```
;Location         0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348            3022    3023    3024    3025    3026    3027    3033    3036
U 1350            3037    3038    3041    3043    3044    3045    3046    3047
U 1358            3048    3049    3050    3051    3052    3053    3057    3060
U 1360            3061    3062    3063    3066    3067    3069    3072    3073
U 1368            3074    3075    3076    3077    3078    3079    3080    3084
U 1370            3087    3088    3089    3090    3093    3094    3095    3109
U 1378            3114    3115    3116    3117    3118    3119    3130    3135
U 1380            3136    3137    3138    3139    3140    3151    3156    3157
U 1388            3158    3159    3160    3161    3172    3177    3178    3179
U 1390            3180    3181    3182    3193    3198    3199    3200    3201
U 1398            3202    3203    3204    3205    3216    3221    3222    3223
U 13A0            3224    3225    3226    3227    3228    3239    3244    3245
U 13A8            3246    3247    3248    3249    3269    3270    3271    3272
U 13B0            3273    3274    3275    3276    3277    3278    3301    3325
U 13B8            3328    3333    3336    3337    3340    3343    3344    3345
U 13C0            3372    3375    3376    3377    3386    3389    3390    3391
U 13C8            3392    3393    3394    3395    3399    3400    3401    3405
U 13D0            3406    3407
U 13D8 - 13EF Unused
U 13F0            1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8            1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
           Words not
           in bounds
 ESKOODEF          0
 ESKOOMAC          0
 ESKAHMAC          0
  ESKAH23        994

Used             994
Remaining

Total microwords used in memory U: 994
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH23.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 1806  MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2139  TEST 6F QK/DECIMAL.CONSTANT TEST 1
; 2190  TEST 70 QK/DECIMAL.CONSTANT TEST 2
; 2238  TEST 71 LOAD OR SHIFT D CONDITIONAL FUNCTION TEST
; 2289  TEST 72 SHIFT VALUE INPUT TO THE DAL TEST
; 2347  TEST 73 SHIFT VALUE LOGIC AND EBMX/SHF.VAL TEST
; 2418  TEST 74 USI TEST USING THE SHF MUX
; 2654  TEST 75 SIGN CONTROL AND BEN SS (SIGN SOURCE ) TEST
; 2833  TEST 76 BMX/PACKED.FL TEST
; 2880  TEST 77 BEN ALU.N TEST
; 2983  TEST 78 WRITE RAB WITH DT/BYTE TEST
; 3034  TEST 79 WRITE RAB WITH DT/WORD TEST
; 3085  TEST 7A SC AS ADDRESS SOURCE FOR RC REGISTERS TEST
; 3154  TEST 7B RA AND RB ADDRESSED BY SC TEST
; 3224  TEST 7C LA_RA[0-7] TEST
```

```
;1      .NOLIST
;1804   .LIST
;1805
```

U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U

```
                                                 .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                          .REGION/1000,13FF
                                          ;+
                                          ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                          ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[0F].
                                          ; R[0F] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                          ; THIS IS DONE BY SETTING THE BIT IN R[0F] THAT CORRESPONDS TO THE NUMBER
                                          ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                          ;
                                          ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                          ;       6 IN SCRATCH PAD R[0F]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                          ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                          ;       R[0F] AND DO A RETURN0.
                                          ;
                                          ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[0F], THE TRAP ROUTINE
                                          ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                          ; TO THE CONSOLE.
                                          ;
                                          ;-
U 1100, 0000,003C,1980,0800,0084,7003     1100:   SC_K[ZERO],J/TRPH1        ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001     1101:   SC_K[.1],J/TRPH0          ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001     1102:   SC_K[.2],J/TRPH0          ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001     1103:   SC_K[.3],J/TRPH0          ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001     1104:   SC_K[.4],J/TRPH0          ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001     1105:   SC_K[.6],J/TRPH0          ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001     1106:   SC_K[.9],J/TRPH0          ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001     1107:   SC_K[.7],J/TRPH0          ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001     1108:   SC_K[.8],J/TRPH0          ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003     110C:   SC_K[.C],J/TRPH1          ; RDS
U 110D, 0000,003C,8980,0800,0084,7003     110D:   SC_K[.D],J/TRPH1          ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001     110E:   SC_K[.10],J/TRPH0         ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003     110F:   SC_K[.F],J/TRPH1          ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,1046     TRPH0:  Q_ID[USTACK]
U 1046, 0C00,003C,01E0,0800,0000,1056             Q_D,D_Q
U 1056, 0000,003C,8180,3C00,0000,105B             ID[USTACK]_D
U 105B, 0C00,003C,01E0,0800,0000,1109             Q_D,D_Q
U 1109, 0000,003C,01C0,0A78,0000,1154             Q_R[0F]
U 1154, 0001,2024,0180,0800,0010,11E1             A[U_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 11E1, 0000,013C,0180,0800,0000,1002             Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000     =0      ALU_Q.AND.MASK,R[0F]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
                                          ;+
                                          ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                          ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                          ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                          ;
                                          ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                          ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                          ;             FAULT STATUS REGISTER
                                          ;             SBI ERROR REGISTER
                                          ;             TIMEOUT ADDRESS REGISTER
                                          ;             MAINTENANCE REGISTER
                                          ;             CACHE PARITY REGISTER
                                          ;             TB ERROR REGISTER 1
                                          ;             TB ERROR REGISTER 0
                                          ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,1004   ;1861   TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,7207   ;1862   =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,11E2   ;1863           Q_ID[TBER0]
U 11E2, 0001,203C,4DF0,2DB0,0000,11E3   ;1864           RC[6]_Q,Q_ID[TBER1]
U 11E3, 0001,203C,65F0,2DB8,0000,11E4   ;1865           RC[7]_Q,Q_ID[SBI.ERR]
U 11E4, 0001,203C,6DF0,2DD8,0000,11E5   ;1866           RC[0B]_Q,Q_ID[FAULT]
U 11E5, 0001,203C,75F0,2DE0,0000,11E6   ;1867           RC[0C]_Q,Q_ID[MAINT]
U 11E6, 0001,203C,79F0,2DC8,0000,11E7   ;1868           RC[9]_Q,Q_ID[PARITY]
U 11E7, 0001,203C,69F0,2DC0,0000,11E8   ;1869           RC[8]_Q,Q_ID[TIME.ADDR]
U 11E8, 0001,203C,81F0,2DD0,0000,1000   ;1870           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1201   ;1871   1000:   RC[0E]_Q,ERROR1
                                        ;1872   ;+
                                        ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1875   ;               NEWTST
                                        ;1876   ;               ERLOOP
                                        ;1877   ;               ERROR1
                                        ;1878   ;               ERROR2
                                        ;1879   ;
U 11E9, 0000,003C,65F8,0800,0084,71EA   ;1880   SCOPE:  SC_K[.10],Q_0                    ; SETUP TO WRITE IPL OF 1F
U 11EA, 0818,0038,8D80,0800,0000,11EB   ;1881           D_K[.1F]                         ; ...
U 11EB, 0D00,003C,0180,0800,0000,11EC   ;1882           D_DAL.SC
U 11EC, 0000,003C,3D80,3C00,0000,11ED   ;1883           ID[PSL]_D                        ; WRITE THE PSL
U 11ED, 0818,0038,0580,0800,0000,11F0   ;1884           D_K[.1]                          ; SETUP TO CLEAR THE CES REGISTER
U 11F0, 0D00,003C,0180,0800,0000,11F1   ;1885           D_DAL.SC
U 11F1, 0F00,003C,3180,3C00,0000,11F2   ;1886           ID[CES]_D,D_0                    ; CLEAR THE CES REGISTER
U 11F2, 0000,003C,5D80,3C00,0000,11F3   ;1887           ID[ACC.CS]_D                     ; SHUT OFF THE FLOATING POINT
U 11F3, 0000,003C,3980,3C00,0000,11F4   ;1888           ID[SIR]_D                        ; CLEAR THE SIR REGISTER
U 11F4, 0000,003C,2980,3C00,0000,11F5   ;1889           ID[CLK.CS]_D                     ; STOP INTERVAL TIMER
U 11F5, 0000,003C,4980,3C00,0000,11F6   ;1890           ID[TBER0]_D                      ; SHUT OFF THE TB
U 11F6, 0818,0038,C180,0800,0000,11F7   ;1891           D_K[.FFFF]
U 11F7, 0000,003C,6580,3C00,0000,11F8   ;1892           ID[SBI.ERR]_D
U 11F8, 0F00,003C,6D80,3C00,0000,11F9   ;1893           ID[FAULT]_D,D_0
U 11F9, 0000,003C,6D80,3C00,0000,11FA   ;1894           ID[FAULT]_D
U 11FA, 0000,003C,6580,3C00,0000,11FB   ;1895           ID[SBI.ERR]_D
U 11FB, 0003,003C,0180,09F0,0000,11FC   ;1896           RC[0E]_0
U 11FC, 0003,003C,0180,0AF8,0000,11FD   ;1897           R[0F]_0
U 11FD, 0003,003C,0180,09E8,0000,105E   ;1898           RC[0D]_0,J/CALLCON               ; CALL THE CONSOLE
U 1200, 0818,0038,0980,0800,0000,105E   ;1899   ERLOOP: D_K[.2],J/CALLCON                ; ERRLOOP CALL
U 1201, 0810,0038,0180,0978,0000,1202   ;1900   ERROR1: D_RC[0F]
U 1202, 0819,0034,4D80,0800,0000,104E   ;1901           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1902   104E:   D_D.OR.K[.4],J/CALLCON
U 1203, 0810,0038,0180,0978,0000,1204   ;1903   ERROR2: D_RC[0F]
U 1204, 0819,0034,4D80,0800,0000,105A   ;1904           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1905   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1906   105E:
                                        ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1908           ID[TXDB]_D,J/CALLCON             ; CALL THE CONSOLE
                                        ;1909   ;+
                                        ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1912   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1913   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1914   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1915   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5    ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6    ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7    ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8    ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9    ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA    ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB    ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC    ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD    ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE    ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF    ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155    ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA    ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,1205    ;1929   12AA:   NOP
                                         ;1930   ;+
                                         ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                         ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                         ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                         ;1934   ; TYPING IT.
                                         ;1935   ;-
U 1205, 0810,0038,4D80,0978,0000,1206    ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 1206, 0019,4016,4D80,09F8,0000,0001    ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                         ;1938   ;+
                                         ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                         ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                         ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                         ;1942   ;-
U 1207, 0010,0038,01C0,0978,0000,1208    ;1943   SETRCF: Q_RC[OF]
U 1208, 0019,2034,4DC0,0800,0000,1209    ;1944           Q_Q.AND.K[.FF00]
U 1209, 0019,2032,1D80,09F8,0000,0001    ;1945           RC[OF]_Q.OR.SC,RETURN1
                                         ;1946
                                         ;1947   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 120A, 0118,0038,1B80,0800,0000,1210    ;1948   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 120B, 0118,0038,0B80,0800,0000,1210    ;1949   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 120C, 0118,0038,0780,0800,0000,1210    ;1950   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 120D, 0118,0038,C380,0800,0000,1210    ;1951   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
                                         ;1952   =0000
U 1010, 0018,0038,1980,0800,0000,120A    ;1953   DC0:    ALU_0(K),J/S00
U 1011, 0018,0038,1980,0800,0000,120B    ;1954   DC1:    ALU_0(K),J/S01
U 1012, 0018,0038,1980,0800,0000,120C    ;1955   DC2:    ALU_0(K),J/S10
U 1013, 0018,0038,1980,0800,0000,120D    ;1956   DC3:    ALU_0(K),J/S11
U 1014, 0018,0038,0980,0800,0000,120A    ;1957   DC4:    ALU_K[.2],J/S00
U 1015, 0018,0038,0980,0800,0000,120B    ;1958   DC5:    ALU_K[.2],J/S01
U 1016, 0018,0038,0980,0800,0000,120C    ;1959   DC6:    ALU_K[.2],J/S10
U 1017, 0018,0038,0980,0800,0000,120D    ;1960   DC7:    ALU_K[.2],J/S11
U 1018, 0018,0038,0580,0800,0000,120A    ;1961   DC8:    ALU_K[.1],J/S00
U 1019, 0018,0038,0580,0800,0000,120B    ;1962   DC9:    ALU_K[.1],J/S01
U 101A, 0018,0038,0580,0800,0000,120C    ;1963   DCA:    ALU_K[.1],J/S10
U 101B, 0018,0038,0580,0800,0000,120D    ;1964   DCB:    ALU_K[.1],J/S11
U 101C, 0018,0038,C180,0800,0000,120A    ;1965   DCC:    ALU_K[.FFFF],J/S00
U 101D, 0018,0038,C180,0800,0000,120B    ;1966   DCD:    ALU_K[.FFFF],J/S01
U 101E, 0018,0038,C180,0800,0000,120C    ;1967   DCE:    ALU_K[.FFFF],J/S10
U 101F, 0018,0038,C180,0800,0000,120D    ;1968   DCF:    ALU_K[.FFFF],J/S11
U 1210, 0100,003E,0380,0800,0000,0001    ;1969   SX:     D_D.LEFT2,SI/7,RETURN1
U 1211, 0018,0038,01C0,0800,0000,1006    ;1970   DC.6:   Q_K[.8]
```

```
                                         ;1971   =0
U 1006, 0000,003D,0180,0800,0000,1016    ;1972   DC.6A:  CALL,J/DC6
U 1007, 0019,2000,05C0,0800,0010,1212    ;1973           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1212, 0000,013C,0180,0800,0000,1008    ;1974           Z?
U 1008, 0000,003C,0180,0800,0000,1006    ;1975   =0      J/DC.6A
U 1009, 0000,003E,0180,0800,0000,0001    ;1976           RETURN1
U 1213, 0018,0038,0580,0800,0000,1214    ;1977   DCAAAA: ALU_K[.1]
U 1214, 0118,0038,0780,0800,0000,1215    ;1978           ALU_K[.1],D_D.LEFT2,SI/7
U 1215, 0118,0038,0780,0800,0000,1216    ;1979           ALU_K[.1],D_D.LEFT2,SI/7
U 1216, 0118,0038,0780,0800,0000,1217    ;1980           ALU_K[.1],D_D.LEFT2,SI/7
U 1217, 0118,0038,0780,0800,0000,1218    ;1981           ALU_K[.1],D_D.LEFT2,SI/7
U 1218, 0118,0038,0780,0800,0000,1219    ;1982           ALU_K[.1],D_D.LEFT2,SI/7
U 1219, 0118,0038,0780,0800,0000,121A    ;1983           ALU_K[.1],D_D.LEFT2,SI/7
U 121A, 0118,0038,0780,0800,0000,121B    ;1984           ALU_K[.1],D_D.LEFT2,SI/7
U 121B, 0100,003E,0380,0800,0000,0001    ;1985           D_D.LEFT2,SI/7,RETURN1
U 121C, 0018,0038,0980,0800,0000,121D    ;1986   DRAAAA: ALU_K[.2]
U 121D, 0218,0038,0B80,0800,0000,1220    ;1987           ALU_K[.2],D_D.RIGHT2,SI/7
U 1220, 0218,0038,0B80,0800,0000,1221    ;1988           ALU_K[.2],D_D.RIGHT2,SI/7
U 1221, 0218,0038,0B80,0800,0000,1222    ;1989           ALU_K[.2],D_D.RIGHT2,SI/7
U 1222, 0218,0038,0B80,0800,0000,1223    ;1990           ALU_K[.2],D_D.RIGHT2,SI/7
U 1223, 0218,0038,0B80,0800,0000,1224    ;1991           ALU_K[.2],D_D.RIGHT2,SI/7
U 1224, 0218,0038,0B80,0800,0000,1225    ;1992           ALU_K[.2],D_D.RIGHT2,SI/7
U 1225, 0218,0038,0B80,0800,0000,1226    ;1993           ALU_K[.2],D_D.RIGHT2,SI/7
U 1226, 0200,003E,0380,0800,0000,0001    ;1994           D_D.RIGHT2,SI/7,RETURN1
U 1227, 0F00,003C,0180,0800,0000,1228    ;1995   DC.NF:  D_0
U 1228, 0819,0000,0580,0800,0000,1010    ;1996           D_D-K[.1],J/DC0
                                         ;1997   ; THIS TABLE IS ISED AS A TARGET TO TEST  BRANCHES.
                                         ;1998   ; NOTE THAT IT RETURNS BY RETURN2 IF Q IS
                                         ;1999   ; ZERO AFTER EXECUTION, OR RETURNS BY RETURN1 IF Q IS NON ZERO.
                                         ;2000   =0000
U 1020, 0019,2000,05C0,0800,0000,1021    ;2001   BRTBLE: Q_Q-K[.1]
U 1021, 0019,2000,05C0,0800,0000,1022    ;2002           Q_Q-K[.1]
U 1022, 0019,2000,05C0,0800,0000,1023    ;2003           Q_Q-K[.1]
U 1023, 0019,2000,05C0,0800,0000,1024    ;2004           Q_Q-K[.1]
U 1024, 0019,2000,05C0,0800,0000,1025    ;2005           Q_Q-K[.1]
U 1025, 0019,2000,05C0,0800,0000,1026    ;2006           Q_Q-K[.1]
U 1026, 0019,2000,05C0,0800,0000,1027    ;2007           Q_Q-K[.1]
U 1027, 0019,2000,05C0,0800,0000,1028    ;2008           Q_Q-K[.1]
U 1028, 0019,2000,05C0,0800,0000,1029    ;2009   BRT1:   Q_Q-K[.1]
U 1029, 0019,2000,05C0,0800,0000,102A    ;2010           Q_Q-K[.1]
U 102A, 0019,2000,05C0,0800,0000,102B    ;2011           Q_Q-K[.1]
U 102B, 0019,2000,05C0,0800,0000,102C    ;2012           Q_Q-K[.1]
U 102C, 0019,2000,05C0,0800,0000,102D    ;2013   BRT2:   Q_Q-K[.1]
U 102D, 0019,2000,05C0,0800,0000,102E    ;2014           Q_Q-K[.1]
U 102E, 0019,2000,05C0,0800,0000,102F    ;2015           Q_Q-K[.1]
U 102F, 0001,203C,0180,0800,0010,1229    ;2016           ALU_Q,CLK.UBCC
U 1229, 001D,2114,01C0,0800,0000,100A    ;2017           Z?,ALU_Q+D,Q_ALU
U 100A, 0000,003E,0180,0800,0000,0001    ;2018   =0      RETURN1
U 100B, 0000,003E,0180,0800,0000,0002    ;2019           RETURN2
                                         ;2020   ; THESE SUBROUTINES ARE USED TO SHIFT ZEROES INTO THE Q REGISTER.
                                         ;2021   =0
U 100C, 0000,003D,0180,0800,0000,122A    ;2022   SHQLFT16:       CALL,J/SHQLFT8
U 100D, 0000,003C,0180,0800,0000,122A    ;2023           J/SHQLFT8
U 122A, 0000,003C,01A8,0800,0000,122B    ;2024   SHQLFT8:        Q_Q.LEFT,SI/3
U 122B, 0000,003C,01A8,0800,0000,122C    ;2025   SHQLFT7:        Q_Q.LEFT,SI/3
```

```
U 122C, 0000,003C,01A8,0800,0000,122D   ;2026           Q_Q.LEFT,SI/3
U 122D, 0000,003C,01A8,0800,0000,1230   ;2027           Q_Q.LEFT,SI/3
U 1230, 0000,003C,01A8,0800,0000,1231   ;2028           Q_Q.LEFT,SI/3
U 1231, 0000,003C,01A8,0800,0000,1232   ;2029           Q_Q.LEFT,SI/3
U 1232, 0000,003C,01A8,0800,0000,1233   ;2030           Q_Q.LEFT,SI/3
U 1233, 0000,003E,01A8,0800,0000,0001   ;2031           Q_Q.LEFT,SI/3,RETURN1
                                        ;2032   ; THESE SUBROUTINES ARE USED TO SHIFT 1'S INTO THE Q REGISTE.
                                        ;2033   =0
U 1040, 0000,003D,0180,0800,0000,1234   ;2034   SHQL16: CALL,J/SHQL8
U 1041, 0000,003C,0180,0800,0000,1234   ;2035           J/SHQL8
U 1234, 0000,003C,03A8,0800,0000,1235   ;2036   SHQL8:  Q_Q.LEFT,SI/7
U 1235, 0000,003C,03A8,0800,0000,1236   ;2037   SHQL7:  Q_Q.LEFT,SI/7
U 1236, 0000,003C,03A8,0800,0000,1237   ;2038           Q_Q.LEFT,SI/7
U 1237, 0000,003C,03A8,0800,0000,1238   ;2039           Q_Q.LEFT,SI/7
U 1238, 0000,003C,03A8,0800,0000,1239   ;2040           Q_Q.LEFT,SI/7
U 1239, 0000,003C,03A8,0800,0000,123A   ;2041           Q_Q.LEFT,SI/7
U 123A, 0000,003C,03A8,0800,0000,123B   ;2042           Q_Q.LEFT,SI/7
U 123B, 0000,003E,03A8,0800,0000,0001   ;2043           Q_Q.LEFT,SI/7,RETURN1
                                        ;2044   ; THESE TABLES ARE USED TO WRITE THE RA AND RB SCRATCH PADS.
                                        ;2045   =0000
U 1030, 0001,203E,0180,0A80,0000,0001   ;2046   WRRARB: R[0]_Q,RETURN1
U 1031, 0001,203E,0180,0A88,0000,0001   ;2047           R[1]_Q,RETURN1
U 1032, 0001,203E,0180,0A90,0000,0001   ;2048           R[2]_Q,RETURN1
U 1033, 0001,203E,0180,0A98,0000,0001   ;2049           R[3]_Q,RETURN1
U 1034, 0001,203E,0180,0AA0,0000,0001   ;2050           R[4]_Q,RETURN1
U 1035, 0001,203E,0180,0AA8,0000,0001   ;2051           R[5]_Q,RETURN1
U 1036, 0001,203E,0180,0AB0,0000,0001   ;2052           R[6]_Q,RETURN1
U 1037, 0001,203E,0180,0AB8,0000,0001   ;2053           R[7]_Q,RETURN1
U 1038, 0001,203E,0180,0AC0,0000,0001   ;2054           R[8]_Q,RETURN1
U 1039, 0001,203E,0180,0AC8,0000,0001   ;2055           R[9]_Q,RETURN1
U 103A, 0001,203E,0180,0AD0,0000,0001   ;2056           R[0A]_Q,RETURN1
U 103B, 0001,203E,0180,0AD8,0000,0001   ;2057           R[0B]_Q,RETURN1
U 103C, 0001,203E,0180,0AE0,0000,0001   ;2058           R[0C]_Q,RETURN1
U 103D, 0001,203E,0180,0AE8,0000,0001   ;2059           R[0D]_Q,RETURN1
U 103E, 0001,203E,0180,0AF0,0000,0001   ;2060           R[0E]_Q,RETURN1
U 103F, 0001,203E,0180,0AF8,0000,0001   ;2061           R[0F]_Q,RETURN1
                                        ;2062   ; THESE TABLES ARE USED TO WRITE Q INTO THE RC SCRATCH PADS.
                                        ;2063   =0000
U 1060, 0001,203E,0180,0980,0000,0001   ;2064   WRRC:   RC[0]_Q,RETURN1
U 1061, 0001,203E,0180,0988,0000,0001   ;2065           RC[1]_Q,RETURN1
U 1062, 0001,203E,0180,0990,0000,0001   ;2066           RC[2]_Q,RETURN1
U 1063, 0001,203E,0180,0998,0000,0001   ;2067           RC[3]_Q,RETURN1
U 1064, 0001,203E,0180,09A0,0000,0001   ;2068           RC[4]_Q,RETURN1
U 1065, 0001,203E,0180,09A8,0000,0001   ;2069           RC[5]_Q,RETURN1
U 1066, 0001,203E,0180,09B0,0000,0001   ;2070           RC[6]_Q,RETURN1
U 1067, 0001,203E,0180,09B8,0000,0001   ;2071           RC[7]_Q,RETURN1
U 1068, 0001,203E,0180,09C0,0000,0001   ;2072           RC[8]_Q,RETURN1
U 1069, 0001,203E,0180,09C8,0000,0001   ;2073           RC[9]_Q,RETURN1
U 106A, 0001,203E,0180,09D0,0000,0001   ;2074           RC[0A]_Q,RETURN1
U 106B, 0001,203E,0180,09D8,0000,0001   ;2075           RC[0B]_Q,RETURN1
U 106C, 0001,203E,0180,09E0,0000,0001   ;2076           RC[0C]_Q,RETURN1
U 106D, 0001,203E,0180,09E8,0000,0001   ;2077           RC[0D]_Q,RETURN1
U 106E, 0001,203E,0180,09F0,0000,0001   ;2078           RC[0E]_Q,RETURN1
U 106F, 0001,203E,0180,09F8,0000,0001   ;2079           RC[0F]_Q,RETURN1
                                        ;2080   ; THESE ARE USED TO READ THE RA AND RB SCRATCH PADS
```

```
                                      ;2081   ; INTO LA AND LB.
                                      ;2082   =0000
U 1070, 0000,003E,0180,0A00,0000,0001 ;2083   LTCHAB: LAB_R[0],RETURN1
U 1071, 0000,003E,0180,0A08,0000,0001 ;2084           LAB_R[1],RETURN1
U 1072, 0000,003E,0180,0A10,0000,0001 ;2085           LAB_R[2],RETURN1
U 1073, 0000,003E,0180,0A18,0000,0001 ;2086           LAB_R[3],RETURN1
U 1074, 0000,003E,0180,0A20,0000,0001 ;2087           LAB_R[4],RETURN1
U 1075, 0000,003E,0180,0A28,0000,0001 ;2088           LAB_R[5],RETURN1
U 1076, 0000,003E,0180,0A30,0000,0001 ;2089           LAB_R[6],RETURN1
U 1077, 0000,003E,0180,0A38,0000,0001 ;2090           LAB_R[7],RETURN1
U 1078, 0000,003E,0180,0A40,0000,0001 ;2091           LAB_R[8],RETURN1
U 1079, 0000,003E,0180,0A48,0000,0001 ;2092           LAB_R[9],RETURN1
U 107A, 0000,003E,0180,0A50,0000,0001 ;2093           LAB_R[0A],RETURN1
U 107B, 0000,003E,0180,0A58,0000,0001 ;2094           LAB_R[0B],RETURN1
U 107C, 0000,003E,0180,0A60,0000,0001 ;2095           LAB_R[0C],RETURN1
U 107D, 0000,003E,0180,0A68,0000,0001 ;2096           LAB_R[0D],RETURN1
U 107E, 0000,003E,0180,0A70,0000,0001 ;2097           LAB_R[0E],RETURN1
U 107F, 0000,003E,0180,0A78,0000,0001 ;2098           LAB_R[0F],RETURN1
                                      ;2099   ; THESE ARE USED TO READ THE RC SCRATCH PADS INTO LC.
                                      ;2100   =0000
U 1080, 0000,003E,0180,0900,0000,0001 ;2101   LTCHRC: LC_RC[0],RETURN1
U 1081, 0000,003E,0180,0908,0000,0001 ;2102           LC_RC[1],RETURN1
U 1082, 0000,003E,0180,0910,0000,0001 ;2103           LC_RC[2],RETURN1
U 1083, 0000,003E,0180,0918,0000,0001 ;2104           LC_RC[3],RETURN1
U 1084, 0000,003E,0180,0920,0000,0001 ;2105           LC_RC[4],RETURN1
U 1085, 0000,003E,0180,0928,0000,0001 ;2106           LC_RC[5],RETURN1
U 1086, 0000,003E,0180,0930,0000,0001 ;2107           LC_RC[6],RETURN1
U 1087, 0000,003E,0180,0938,0000,0001 ;2108           LC_RC[7],RETURN1
U 1088, 0000,003E,0180,0940,0000,0001 ;2109           LC_RC[8],RETURN1
U 1089, 0000,003E,0180,0948,0000,0001 ;2110           LC_RC[9],RETURN1
U 108A, 0000,003E,0180,0950,0000,0001 ;2111           LC_RC[0A],RETURN1
U 108B, 0000,003E,0180,0958,0000,0001 ;2112           LC_RC[0B],RETURN1
U 108C, 0000,003E,0180,0960,0000,0001 ;2113           LC_RC[0C],RETURN1
U 108D, 0000,003E,0180,0968,0000,0001 ;2114           LC_RC[0D],RETURN1
U 108E, 0000,003E,0180,0970,0000,0001 ;2115           LC_RC[0E],RETURN1
U 108F, 0000,003E,0180,0978,0000,0001 ;2116           LC_RC[0F],RETURN1
                                      ;2117   ; THIS ROUTINE IS USED TO FILL ALL RA AND RB WITH THE
                                      ;2118   ; CONTENTS OF Q.
                                      ;2119   =0
U 1042, 0F00,003D,0180,0800,0000,1227 ;2120   RARB.Q: D_0,CALL,J/DC.NF
U 1043, 0000,003C,0180,0800,0000,1044 ;2121           NOP
                                      ;2122   =0
U 1044, 0000,193D,0180,0800,0000,1030 ;2123   RARB.QA:        CALL,D3-0?,J/WRRARB
U 1045, 0819,0014,0580,0800,0010,123C ;2124           D_D+K[.1],CLK.UBCC
U 123C, 0000,013C,0180,0800,0000,1048 ;2125           Z?
U 1048, 0000,003C,0180,0800,0000,1044 ;2126   =0      J/RARB.QA
U 1049, 0000,003E,0180,0800,0000,0001 ;2127           RETURN1
                                      ;2128   ; THIS ROUTINE IS USED TO FILL ALL RC WITH THE
                                      ;2129   ; CONTENTS OF Q.
                                      ;2130   =0
U 104A, 0F00,003D,0180,0800,0000,1227 ;2131   RC.Q:   D_0,CALL,J/DC.NF
U 104B, 0000,003C,0180,0800,0000,104C ;2132           NOP
                                      ;2133   =0
U 104C, 0000,193D,0180,0800,0000,1060 ;2134   RC.QA:  CALL,D3-0?,J/WRRC
U 104D, 0819,0014,0580,0800,0010,123D ;2135           D_D+K[.1],CLK.UBCC
```

```
U 123D, 0000,013C,0180,0800,0000,1050   ;2136           Z?
U 1050, 0000,003C,0180,0800,0000,104C   ;2137   =0      J/RC.QA
U 1051, 0000,003E,0180,0800,0000,0001   ;2138           RETURN1
```

```
                                                      .PAGE   "TEST 6F        QK/DECIMAL.CONSTANT TEST 1"
                                               ;********************************************************
                                               ;++
                                               ; TEST  6F      QK/DECIMAL.CONSTANT TEST 1
                                               ;
                                               ; TEST DESCRIPTION
                                               ;       THIS IS A TEST OF THE UQK FUNCTION WHICH CONTROLS
                                               ;       THE GENERATION OF A DECIMAL CONSTANT IN THE Q
                                               ;       REGISTER.
                                               ;       THESE CONSTANTS ARE GENERATED:
                                               ;               66666660
                                               ;               66666606
                                               ;               66666066
                                               ;                  ...ETC. THROUGH
                                               ;               06666666
                                               ;
                                               ; LOGIC DESCRIPTION
                                               ;
                                               ; ERROR DESCRIPTION
                                               ;
                                               ;       EXPECTED RESULT
                                               ;       ACTUAL RESULT
                                               ;
                                               ;--
                                               ;********************************************************
                                               =0
U 1052, 0000,003D,0180,0800,0000,11E9          QDC1:   NEWTST
U 1053, 081B,0000,0580,0800,0000,1240                  ALU_0-K[.1],D_ALU
U 1240, 0819,0024,6180,0800,0000,1241                  ALU_D[ANDNOT]R[.F],D_ALU
U 1241, 0001,003C,0180,0AA0,0000,1054                  R[4]_D                  ; R[4]=FFFFFFF0
U 1054, 0F00,003D,0180,0800,0000,1211          =0      D_0,CALL,J/DC.6
U 1055, 0001,003C,0180,0AA8,0000,1242                  R[5]_D                  ; R[5]=66666666
U 1242, 0018,0038,5D80,0A98,0000,1058                  R[3]_K[.7]              ; R[3]=7
U 1058, 0000,003D,0180,0800,0000,1200          =0      ERLOOP
U 1059, 0800,003C,0180,0A20,0000,1243          QDC1A:  LAB_R[4],D_LA
U 1243, 000C,0014,01D0,0800,0000,1244                  ALU_LA[A+B]LB,QK/DEC.CON ; TEST INSTRUCTION
U 1244, 081C,2024,0180,0A28,0000,1245                  LAB_R[5],ALU_LA[ANDNOT]D,D_ALU ; GENERATE EXPECTED RESULT.
U 1245, 0018,0038,0980,09F8,0000,1246                  RC[0F]_K[.2]            ; SAVE GOT AND EXPECTED DATA
U 1246, 0001,003C,0180,09F0,0000,1247                  RC[0E]_D                ; IN CASE OF ERROR.
U 1247, 0001,203C,0180,09E8,0000,1248                  RC[0D]_Q
U 1248, 001D,2000,0180,0800,0010,1249                  ALU_Q-D,CLK.UBCC
U 1249, 0000,013C,0180,0800,0000,105C                  Z?
U 105C, 0000,003D,0180,0800,0000,1201          =0      ERROR1                  ; INCORRECT DECIMAL CONSTANT.
U 105D, 0000,003C,0180,0A18,0010,124A                  ALU_R[3],CLK.UBCC
U 124A, 0000,013C,0180,0800,0000,1090                  Z?
U 1090, 0018,0000,0580,0A98,0000,1092          =0      R[3]_LA-K[.1],J/QDC1B
U 1091, 0000,003C,0180,0800,0000,124B                  J/QDC1C
                                               =0
U 1092, 0800,003D,0180,0A20,0000,101F          QDC1B:  D_R[4],CALL,J/DCF
U 1093, 0001,003C,0180,0AA0,0000,1059                  R[4]_D,J/QDC1A
U 124B, 0000,003C,0180,0800,0000,1094          QDC1C:  NOP
```

```
                                                .PAGE   "TEST 70        QK/DECIMAL.CONSTANT TEST 2"
                                        ;******************************************************
                                        ;++
                                        ; TEST  70      QK/DECIMAL.CONSTANT TEST 2
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF THE UQK FUNCTION WHICH CONTROLS
                                        ;       THE GENERATION OF A DECIMAL CONSTANT IN THE Q
                                        ;       REGISTER.
                                        ;       THESE CONSTANTS ARE GENERATED:
                                        ;               00000006
                                        ;               00000060
                                        ;               00000600
                                        ;                  ...ETC. THROUGH
                                        ;               60000000
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED RESULT
                                        ;       ACTUAL RESULT
                                        ;
                                        ;--
                                        ;******************************************************
                                        =0
U 1094, 0000,003D,0180,0800,0000,11E9   QDC2:   NEWTST
U 1095, 0018,0038,6180,0AA0,0000,1096           R[4]_K[.F]              ; R[4]=0000000F
U 1096, 0F00,003D,0180,0800,0000,1211   =0      D_0,CALL,J/DC.6
U 1097, 0001,003C,0180,0AA8,0000,124C           R[5]_D                  ; R[5]=66666666
U 124C, 0018,0038,5D80,0A98,0000,1098           R[3]_K[.7]              ; R[3]=7
U 1098, 0000,003D,0180,0800,0000,1200   =0      ERLOOP
U 1099, 0800,003C,0180,0A20,0000,124D   QDC2A:  LAB_R[4],D_LA
U 124D, 000C,0014,01D0,0800,0000,1250           ALU_LA[A+B]LB,QK/DEC.CON ; TEST INSTRUCTION
U 1250, 081C,2024,0180,0A28,0000,1251           LAB_R[5],ALU_LA[ANDNOT]D,D_ALU ; GENERATE EXPECTED RESULT.
U 1251, 0018,0038,0980,09F8,0000,1252           RC[0F]_K[.2]            ; SAVE GOT AND EXPECTED DATA
U 1252, 0001,003C,0180,09F0,0000,1253           RC[0E]_D                ; IN CASE OF ERROR.
U 1253, 0001,203C,0180,09E8,0000,1254           RC[0D]_Q
U 1254, 001D,2000,0180,0800,0010,1255           ALU_Q-D,CLK.UBCC
U 1255, 0000,013C,0180,0800,0000,109A           Z?
U 109A, 0000,003D,0180,0800,0000,1201   =0      ERROR1                  ; INCORRECT DECIMAL CONSTANT.
U 109B, 0000,003C,0180,0A18,0010,1256           ALU_R[3],CLK.UBCC
U 1256, 0000,013C,0180,0800,0000,109C           Z?
U 109C, 0018,0000,0580,0A98,0000,10A0   =0      R[3]_LA-K[.1],J/QDC2B
U 109D, 0000,003C,0180,0800,0000,1258           J/QDC2C
                                        =0
U 10A0, 0800,003D,0180,0A20,0000,101F   QDC2B:  D_R[4],CALL,J/DCF
U 10A1, 0001,003C,0180,0AA0,0000,1099           R[4]_D,J/QDC2A
U 1258, 0000,003C,0180,0800,0000,10A2   QDC2C:  NOP
```

```
                                         ;2238          .PAGE   "TEST 71        LOAD OR SHIFT D CONDITIONAL FUNCTION TEST"
                                         ;2239   ;*********************************************************
                                         ;2240   ;++
                                         ;2241   ; TEST  71      LOAD OR SHIFT D CONDITIONAL FUNCTION TEST
                                         ;2242   ;
                                         ;2243   ; TEST DESCRIPTION
                                         ;2244   ;      THIS IS A TEST OF THE UDK FUNCTION WHICH CONDITIONALLY
                                         ;2245   ;      LOADS OR SHIFTS THE D REGISTER.
                                         ;2246   ;      IF NOT ALU CARRY 31 SHIFT LEFT, ELSE LOAD FROM SHF MUX.
                                         ;2247   ;
                                         ;2248   ; LOGIC DESCRIPTION
                                         ;2249   ;
                                         ;2250   ; ERROR DESCRIPTION
                                         ;2251   ;      EXPECTED RESULT
                                         ;2252   ;      ACTUAL RESULT
                                         ;2253   ;
                                         ;2254   ;--
                                         ;2255   ;*********************************************************
                                         ;2256   =0
U 10A2, 0000,003D,0180,0800,0000,11E9   ;2257   DK10:   NEWTST
U 10A3, 0F18,0038,C180,0800,0000,1259   ;2258           D_0,ALU_K[.FFFF]          ; GENERATE SOME CONSTANTS
U 1259, 0600,003C,0380,0800,0000,125A   ;2259           D_D.RIGHT,SI/7            ; NEEDED TO PERFORM THE TEST
U 125A, 0018,0038,0980,09F8,0000,125B   ;2260           RC[0F]_K[.2]
U 125B, 0001,003C,0180,0A88,0000,10A4   ;2261           R[1]_D                    ; R[1]=80000000
U 10A4, 0000,003D,0180,0800,0000,1213   ;2262   =0      CALL,J/DCAAAA
U 10A5, 0000,003C,0180,0800,0000,10A6   ;2263           NOP
U 10A6, 0000,003D,0180,0800,0000,1213   ;2264   =0      CALL,J/DCAAAA
U 10A7, 0001,003C,0180,0A90,0000,10A8   ;2265           R[2]_D                    ; R[2]=AAAAAAAA
U 10A8, 0000,003D,0180,0800,0000,1211   ;2266   =0      CALL,J/DC.6
U 10A9, 0001,003C,0180,0A98,0000,125C   ;2267           R[3]_D                    ; R[3]=66666666
U 125C, 0500,003C,0180,0800,0000,125D   ;2268           D_D.LEFT,SI/3
U 125D, 0001,003C,01E0,09F0,0000,125E   ;2269           RC[0E]_D,Q_D
U 125E, 0800,003C,0180,0A18,0000,1260   ;2270           D_R[3]
                                         ;2271                                     ; TEST INSTRUCTION
U 1260, 0418,0014,1980,0A10,0000,1261   ;2272           LAB_R[2],AMX/LA,K[ZERO],BMX/KMX,ALU/A+B,SHF/ALU,DK/DIV
U 1261, 0001,003C,0180,09E8,0000,1262   ;2273           RC[0D]_D
U 1262, 001D,2000,0180,0800,0010,1263   ;2274           ALU_Q-D,CLK.UBCC
U 1263, 0000,013C,0180,0800,0000,10AA   ;2275           Z?
U 10AA, 0000,003D,0180,0800,0000,1201   ;2276   =0      ERROR1                    ; FAILED WITH ALU CARRY 31 = 0
U 10AB, 0000,003C,0180,0800,0000,10AC   ;2277           NOP
U 10AC, 0000,003D,0180,0800,0000,1200   ;2278   =0      ERLOOP
U 10AD, 0800,003C,0180,0A18,0000,1264   ;2279           D_R[3]
U 1264, 0000,003C,01C0,0A08,0000,1265   ;2280           Q_R[1]
U 1265, 0000,003C,0180,0A10,0000,1266   ;2281           LAB_R[2]
                                         ;2282                                     ; TEST INSTRUCTION:
U 1266, 041C,0014,01C0,09F0,0000,1268   ;2283           ALU_LA[A+B]Q,RC[0E]_ALU,DK/DIV,Q_ALU
U 1268, 0001,003C,0180,09E8,0000,1269   ;2284           RC[0D]_D
U 1269, 001D,2000,0180,0800,0010,126A   ;2285           ALU_Q-D,CLK.UBCC
U 126A, 0000,013C,0180,0800,0000,10B0   ;2286           Z?
U 10B0, 0000,003D,0180,0800,0000,1201   ;2287   =0      ERROR1                    ; FAILED WITH ALU CARRY 31 = 1
U 10B1, 0000,003C,0180,0800,0000,10B2   ;2288           NOP
```

```
                                        .PAGE   "TEST 72        SHIFT VALUE INPUT TO THE DAL TEST"
                                        ;*******************************************************
                                        ;++
                                        ; TEST  72      SHIFT VALUE INPUTS TO THE DAL TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF THE SHIFT VALUE LOGIC AND ITS INPUTS
                                        ;       TO THE DAL SHIFTER.
                                        ;       TEST DATA PATTERNS ARE GENERATED IN THE SAME SEQUENCE
                                        ;       USED IN THE PREVIOUS TEST, (SEE ABOVE TEST DESCRIPTION).
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED RESULT
                                        ;       ACTUAL RESULT
                                        ;
                                        ;--
                                        ;*******************************************************
                                        =0
U 10B2, 0000,003D,0180,0800,0000,11E9   SVB:    NEWTST
U 10B3, 0018,0038,8D80,0A88,0000,126B           R[1]_K[.1F]                     ; SET UP SOME COUNTERS.
U 126B, 0018,0038,8D80,0A90,0000,126C           R[2]_K[.1F]
U 126C, 0018,0038,0D80,09F8,0000,126D           RC[0F]_K[.3]
U 126D, 0000,003C,0180,0A10,0000,126E   SVB1:   LAB_R[2]
U 126E, 0018,0000,0580,0A98,0000,10B4           R[3]_LA-K[.1]
U 10B4, 0000,003D,0180,0800,0000,1200   =0      ERLOOP
U 10B5, 0000,003C,0180,0A10,0082,1270   SVB2:   SC_R[2]                         ; SET THE MOST SIGNIFICANT
U 1270, 0803,001C,0180,0800,0000,1271           ALU_NOT.MASK,D_ALU              ; BIT OF THE OPERAND
U 1271, 0000,003C,0180,0A18,0082,1272           SC_R[3]                         ; SET THE LEAST SIGNIFICANT
U 1272, 0801,001C,0180,09E0,0000,1273           ALU_D.ORNOT.MASK,D_ALU,RC[0C]_ALU ; BIT OF THE OPERAND
U 1273, 0000,003C,01C0,0A10,0000,1274           Q_R[2]                          ; COMPUTE EXPECTED RESULT
U 1274, 0000,003C,0180,0A08,0000,1275           LAB_R[1]
U 1275, 001C,0000,0180,0AA8,0000,1276           ALU_LA[A-B]Q,R[5]_ALU
U 1276, 0001,003C,0180,0AA0,0000,1278           R[4]_D
U 1278, 0000,003C,01F8,0A28,0082,1279           SC_R[5],Q_0
U 1279, 0D00,003C,0180,0800,0000,127A           D_DAL.SC
U 127A, 0001,003C,0180,09F0,0000,127B           RC[0E]_D
U 127B, 0000,003C,19F8,0800,0084,727C           Q_0,SC_K[ZERO]
U 127C, 0800,003C,0180,0A20,0000,127D           D_R[4]
U 127D, 0E00,003C,0180,0800,0000,127E           D_DAL.NORM                      ; TEST INSTRUCTION
U 127E, 0001,003C,0180,09E8,0000,1280           RC[0D]_D
U 1280, 0010,0038,01C0,0970,0000,1281           Q_RC[0E]
U 1281, 001D,2000,0180,0800,0010,1282           ALU_Q-D,CLK.UBCC                : RESULT CORRECT?
U 1282, 0000,013C,0180,0800,0000,10B6           Z?
U 10B6, 0000,003D,0180,0800,0000,1201   =0      ERROR1
U 10B7, 0000,003C,0180,0A18,0010,1283           ALU_R[3],CLK.UBCC
U 1283, 0000,013C,0180,0800,0000,10B8           Z?
U 10B8, 0018,0000,0580,0A98,0000,10B5   =0      R[3]_LA-K[.1],J/SVB2
U 10B9, 0000,003C,0180,0A10,0010,1284           ALU_R[2],CLK.UBCC
U 1284, 0000,013C,0180,0800,0000,10BA           Z?
U 10BA, 0000,003C,0180,0800,0000,1285   =0      J/SVB3
U 10BB, 0000,003C,0180,0800,0000,1288           J/SVB4
U 1285, 0018,0000,0580,0A90,0010,1286   SVB3:   R[2]_LA-K[.1],CLK.UBCC
U 1286, 0000,013C,0180,0800,0000,10BC           Z?
```

```
U 10BC, 0000,003C,0180,0800,0000,126D   ;2344   =0        J/SVB1
U 10BD, 0003,003C,0180,0A98,0000,10B5   ;2345             R[3]_0,J/SVB2
U 1288, 0000,003C,0180,0800,0000,10C0   ;2346   SVB4:     NOP
```

```
                                         ;2347          .PAGE   "TEST 73        SHIFT VALUE LOGIC AND EBMX/SHF.VAL TEST"
                                         ;2348     ;***********************************************************
                                         ;2349     ;++
                                         ;2350     ; TEST  73      SHIFT VALUE LOGIC AND EBMX/SHF.VAL TEST
                                         ;2351     ;
                                         ;2352     ; TEST DESCRIPTION
                                         ;2353     ;       THIS IS A TEST OF THE SHIFT VALUE LOGIC WHICH
                                         ;2354     ;       DETERMINES THE AMOUNT THAT D NEED BE SHIFTED IN
                                         ;2355     ;       ORDER TO BE NORMALIZED. THIS VALUE IS CHECKED
                                         ;2356     ;       BY REFERNCING IT THROUGH THE EBMX OF THE EXPONENT SECTION.
                                         ;2357     ;       TEST DATA USED FOLLOWS THE PATTERN:
                                         ;2358     ;               C0000000
                                         ;2359     ;               A0000000
                                         ;2360     ;               90000000
                                         ;2361     ;               88000000
                                         ;2362     ;               ...THROUGH
                                         ;2363     ;               80000001
                                         ;2364     ;               60000000
                                         ;2365     ;               50000000
                                         ;2366     ;               48000000
                                         ;2367     ;               ...THROUGH
                                         ;2368     ;               40000001
                                         ;2369     ;               30000000
                                         ;2370     ;               ...ETC. THROUGH
                                         ;2371     ;               00000003
                                         ;2372     ;               00000001
                                         ;2373     ;
                                         ;2374     ; LOGIC DESCRIPTION
                                         ;2375     ;
                                         ;2376     ; ERROR DESCRIPTION
                                         ;2377     ;       EXPECTED RESULT
                                         ;2378     ;       ACTUAL RESULT
                                         ;2379     ;       D OPERAND
                                         ;2380     ;
                                         ;2381     ;--
                                         ;2382     ;***********************************************************
                                         ;2383     =0
U 10C0, 0000,003D,0180,0800,0000,11E9    ;2384     SVA:    NEWTST
U 10C1, 0018,0038,8D80,0A88,0000,1289    ;2385             R[1]_K[.1F]             ; SET UP SOME COUNTERS.
U 1289, 0018,0038,8D80,0A90,0000,128A    ;2386             R[2]_K[.1F]
U 128A, 0000,003C,0180,0A10,0000,128B    ;2387     SVA1:   LAB_R[2]
U 128B, 0018,0000,0580,0A98,0000,10C2    ;2388             R[3]_LA-K[.1]
U 10C2, 0000,003D,0180,0800,0000,1200    ;2389     =0      ERLOOP
U 10C3, 0000,003C,0180,0A10,0082,128C    ;2390     SVA2:   SC_R[2]                 ; SET THE MOST SIGNIFICANT
U 128C, 0803,001C,0180,0800,0000,128D    ;2391             ALU_NOT.MASK,D_ALU      ; BIT OF THE OPERAND
U 128D, 0000,003C,0180,0A18,0082,128E    ;2392             SC_R[3]                 ; SET THE LEAST SIGNIFICANT
U 128E, 0801,001C,0180,09E0,0000,1290    ;2393             ALU_D.ORNOT.MASK,D_ALU,RC[0C]_ALU ; BIT OF THE OPERAND
U 1290, 0000,003C,01C0,0A10,0000,1291    ;2394             Q_R[2]
U 1291, 0000,003C,0180,0A08,0000,1292    ;2395             LAB_R[1]
U 1292, 001C,0000,0180,0AA8,0000,1293    ;2396             ALU_LA[A-B]Q,R[5]_ALU   ; COMPUTE EXPECTED RESULT.
U 1293, 0000,003C,0180,0300,008C,7294    ;2397             EBMX/SHF.VAL,EALU7B,SC_EALU ; TEST INSTRUCTION
U 1294, 0018,0038,1DC0,0800,0000,1295    ;2398             Q_SC                    ; GET THE RESULT
U 1295, 0018,0038,0D80,09F8,0000,1296    ;2399             RC[0F]_K[.3]
U 1296, 0000,003C,0180,0A28,0000,1297    ;2400             LAB_R[5]
U 1297, 0000,003C,0180,09F0,0000,12A0    ;2401             RC[0E]_LA
```

```
U 12A0, 0001,203C,0180,09E8,0000,12A1   ;2402           RC[0D]_Q
U 12A1, 001C,0000,0180,0800,0010,12A2   ;2403           ALU_LA[A-B]Q,CLK.UBCC   ; RESULT CORRECT?
U 12A2, 0000,013C,0180,0800,0000,10C4   ;2404           Z?
U 10C4, 0000,003D,0180,0800,0000,1201   ;2405   =0      ERROR1                  ; REPORT FAILURE.
U 10C5, 0000,003C,0180,0A18,0010,12A3   ;2406           ALU_R[3],CLK.UBCC
U 12A3, 0000,013C,0180,0800,0000,10C6   ;2407           Z?
U 10C6, 0018,0000,0580,0A98,0000,10C3   ;2408   =0      R[3]_LA-K[.1],J/SVA2
U 10C7, 0000,003C,0180,0A10,0010,12A4   ;2409           ALU_R[2],CLK.UBCC
U 12A4, 0000,013C,0180,0800,0000,10C8   ;2410           Z?
U 10C8, 0000,003C,0180,0800,0000,12A5   ;2411   =0      J/SVA3
U 10C9, 0000,003C,0180,0800,0000,12A7   ;2412           J/SVA4
U 12A5, 0018,0000,0580,0A90,0010,12A6   ;2413   SVA3:   R[2]_LA-K[.1],CLK.UBCC
U 12A6, 0000,013C,0180,0800,0000,10CA   ;2414           Z?
U 10CA, 0000,003C,0180,0800,0000,128A   ;2415   =0      J/SVA1
U 10CB, 0003,003C,0180,0A98,0000,10C3   ;2416           R[3]_0,J/SVA2
U 12A7, 0000,003C,0180,0800,0000,10CC   ;2417   SVA4:   NOP
```

```
                                                       .PAGE   "TEST 74        USI TEST USING THE SHF MUX"
                                           ;**************************************************************
                                           ;++
                                           ; TEST  74      USI TEST USING THE SHF MUX
                                           ;
                                           ; TEST DESCRIPTION
                                           ;       THIS IS A TEST OF THE SI LOGIC FOR
                                           ;       THE SHF MUX.
                                           ;
                                           ; LOGIC DESCRIPTION
                                           ;
                                           ; ERROR DESCRIPTION
                                           ;       EXPECTED RESULT
                                           ;       ACTUAL RESULT
                                           ;
                                           ;--
                                           ;**************************************************************
                                           =0
U 10CC, 0000,003D,0180,0800,0000,11E9      SHF1:   NEWTST
U 10CD, 0F00,003C,0180,0800,0000,10D0              D_0                     ; GENERATE SOME CONSTANTS
U 10D0, 0000,003D,0180,0800,0000,1213      =0      CALL,J/DCAAAA
U 10D1, 0000,003C,0180,0800,0000,10D2              NOP
U 10D2, 0000,003D,0180,0800,0000,1213      =0      CALL,J/DCAAAA
U 10D3, 0001,003C,0180,0A98,0000,12A8              R[3]_D                  ; R[3]=AAAAAAAA
U 12A8, 0500,003C,0180,0800,0000,12A9              D_D.LEFT,SI/3
U 12A9, 0600,003C,0180,0800,0000,12AB              D_D.RIGHT,SI/3
U 12AB, 0001,003C,0180,0A90,0000,12AC              R[2]_D                  ; R[2]=2AAAAAAA
U 12AC, 0018,0038,0980,09F8,0000,12AD              RC[0F]_K[.2]
U 12AD, 0500,003C,0180,0800,0000,12AE              D_D.LEFT,SI/3
U 12AE, 0001,003C,0180,0AA0,0000,12AF              R[4]_D                  ; R[4]=55555554
U 12AF, 0800,003C,0180,0A18,0000,12B0              D_R[3]
U 12B0, 0018,0038,C180,0800,0000,12B1              ALU_K[.FFFF]
U 12B1, 0500,003C,0380,0800,0000,12B2              D_D.LEFT,SI/7
U 12B2, 0001,003C,0180,0AA8,0000,10D4              R[5]_D                  ; R[5]=55555555
                                           ;////////////////////////////////////////////////////////////////
                                           ;+
                                           ; SUBTEST       1
                                           ; SI=0, PSL<N>=0
                                           ;-
U 10D4, 0000,003D,0180,0800,0000,1205      =0      SUBTEST
U 10D5, 0000,003C,0180,0800,0000,10D6              NOP
U 10D6, 0000,003D,0180,0800,0000,1200      =0      ERLOOP
U 10D7, 0F00,003C,0180,0800,0000,12B3              D_0
U 12B3, 0000,003C,3D80,3C00,0000,12B4              ID[PSL]_D               ; CLEAR PSL<C>
U 12B4, 0820,003C,0000,0A10,0000,12B5              ALU_R[2],SHF/LEFT,SI/0,DK/SHF ; TEST INSTRUCTION
U 12B5, 0001,003C,0180,09E8,0000,12B6              RC[0D]_D
U 12B6, 0000,003C,01C0,0A20,0000,12B7              Q_R[4]                  ; GET EXPECTED RESULT
U 12B7, 0001,203C,0180,09F0,0000,12B8              RC[0E]_Q
U 12B8, 001D,2000,0180,0800,0010,12B9              ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12B9, 0000,013C,0180,0800,0000,10D8              Z?
U 10D8, 0000,003D,0180,0800,0000,1201      =0      ERROR1
U 10D9, 0000,003C,0180,0800,0000,10DA              NOP
                                           ;////////////////////////////////////////////////////////////////
                                           ;+
                                           ; SUBTEST       2
```

```
                                          ;2473   ; SI=0, PSL<N>=1
                                          ;2474   ;-
U 10DA, 0000,003D,0180,0800,0000,1205     ;2475   =0      SUBTEST
U 10DB, 0000,003C,0180,0800,0000,10DC     ;2476           NOP
U 10DC, 0000,003D,0180,0800,0000,1200     ;2477   =0      ERLOOP
U 10DD, 0818,0038,0180,0800,0000,12BA     ;2478           D_K[.8]
U 12BA, 0000,003C,3D80,3C00,0000,12BB     ;2479           ID[PSL]_D               ; SET PSL<C>
U 12BB, 0820,003C,0000,0A10,0000,12BC     ;2480           ALU_R[2],SHF/LEFT,SI/0,DK/SHF
U 12BC, 0001,003C,0180,09E8,0000,12BD     ;2481           RC[0D]_D
U 12BD, 0000,003C,01C0,0A28,0000,12BE     ;2482           Q_R[5]                  ; GET EXPECTED RESULT
U 12BE, 0001,203C,0180,09F0,0000,12BF     ;2483           RC[0E]_Q
U 12BF, 001D,2000,0180,0800,0010,12C0     ;2484           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12C0, 0000,013C,0180,0800,0000,10E0     ;2485           Z?
U 10E0, 0000,003D,0180,0800,0000,1201     ;2486   =0      ERROR1
U 10E1, 0000,003C,0180,0800,0000,10E2     ;2487           NOP
                                          ;2488   ;////////////////////////////////////////////////////////
                                          ;2489   ;+
                                          ;2490   ; SUBTEST       3
                                          ;2491   ; SI=1, ALU 31=0, SHIFT RIGHT1
                                          ;2492   ;-
U 10E2, 0000,003D,0180,0800,0000,1205     ;2493   =0      SUBTEST
U 10E3, 0000,003C,0180,0800,0000,10E4     ;2494           NOP
U 10E4, 0000,003D,0180,0800,0000,1200     ;2495   =0      ERLOOP
U 10E5, 0840,003C,0080,0A10,0000,12C1     ;2496           ALU_R[2],SHF/RIGHT,SI/1,DK/SHF ; TEST INSTRUCTION
U 12C1, 0001,003C,0180,09E8,0000,12C2     ;2497           RC[0D]_D
U 12C2, 0000,003C,01C0,0A10,0000,12C3     ;2498           Q_R[2]                  ; GET EXPECTED RESULT
U 12C3, 0000,003C,0180,0800,0000,12C4     ;2499           Q_Q.RIGHT,SI/ZERO
U 12C4, 0001,203C,0180,09F0,0000,12C5     ;2500           RC[0E]_Q
U 12C5, 001D,2000,0180,0800,0010,12C6     ;2501           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12C6, 0000,013C,0180,0800,0000,10E6     ;2502           Z?
U 10E6, 0000,003D,0180,0800,0000,1201     ;2503   =0      ERROR1
U 10E7, 0000,003C,0180,0800,0000,10E8     ;2504           NOP
                                          ;2505   ;////////////////////////////////////////////////////////
                                          ;2506   ;+
                                          ;2507   ; SUBTEST       4
                                          ;2508   ; SI=1, SHIFT RIGHT1, ALU 31=1
                                          ;2509   ;-
U 10E8, 0000,003D,0180,0800,0000,1205     ;2510   =0      SUBTEST
U 10E9, 0000,003C,0180,0800,0000,10EA     ;2511           NOP
U 10EA, 0000,003D,0180,0800,0000,1200     ;2512   =0      ERLOOP
U 10EB, 0840,003C,0080,0A18,0000,12C7     ;2513           ALU_R[3],SHF/RIGHT,SI/1,DK/SHF ; TEST INSTRUCTION
U 12C7, 0001,003C,0180,09E8,0000,12C8     ;2514           RC[0D]_D
U 12C8, 0000,003C,01C0,0A18,0000,12C9     ;2515           Q_R[3]                  ; GET EXPECTED RESULT
U 12C9, 0000,003C,0380,0800,0000,12CA     ;2516           Q_Q.RIGHT,SI/7
U 12CA, 0001,203C,0180,09F0,0000,12CB     ;2517           RC[0E]_Q
U 12CB, 001D,2000,0180,0800,0010,12CC     ;2518           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12CC, 0000,013C,0180,0800,0000,10EC     ;2519           Z?
U 10EC, 0000,003D,0180,0800,0000,1201     ;2520   =0      ERROR1
U 10ED, 0000,003C,0180,0800,0000,10F0     ;2521           NOP
                                          ;2522   ;////////////////////////////////////////////////////////
                                          ;2523   ;+
                                          ;2524   ; SUBTEST       5
                                          ;2525   ; SI=1, ALU 31=0, SHIFT RIGHT2
                                          ;2526   ;-
U 10F0, 0000,003D,0180,0800,0000,1205     ;2527   =0      SUBTEST
```

```
U 10F1, 0000,003C,0180,0800,0000,10F2   ;2528           NOP
U 10F2, 0000,003D,0180,0800,0000,1200   ;2529   =0      ERLOOP
U 10F3, 0880,003C,0080,0A10,0000,12CD   ;2530           ALU_R[2],SHF/RIGHT2,SI/1,DK/SHF ; TEST INSTRUCTION
U 12CD, 0001,003C,0180,09E8,0000,12CE   ;2531           RC[0D]_D
U 12CE, 0000,003C,01C0,0A10,0000,12CF   ;2532           Q_R[2]                  ; GET EXPECTED RESULT
U 12CF, 0000,003C,0190,0800,0000,12D0   ;2533           Q_Q.RIGHT2,SI/ZERO
U 12D0, 0001,203C,0180,09F0,0000,12D1   ;2534           RC[OE]_Q
U 12D1, 001D,2000,0180,0800,0010,12D2   ;2535           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12D2, 0000,013C,0180,0800,0000,10F4   ;2536           Z?
U 10F4, 0000,003D,0180,0800,0000,1201   ;2537   =0      ERROR1
U 10F5, 0000,003C,0180,0800,0000,10F6   ;2538           NOP
                                        ;2539   ;/////////////////////////////////////////////////////////
                                        ;2540   ;+
                                        ;2541   ; SUBTEST       6
                                        ;2542   ; SI=1, SHIFT RIGHT2, ALU 31=1
                                        ;2543   ;-
U 10F6, 0000,003D,0180,0800,0000,1205   ;2544   =0      SUBTEST
U 10F7, 0000,003C,0180,0800,0000,10F8   ;2545           NOP
U 10F8, 0000,003D,0180,0800,0000,1200   ;2546   =0      ERLOOP
U 10F9, 0880,003C,0080,0A18,0000,12D3   ;2547           ALU_R[3],SHF/RIGHT2,SI/1,DK/SHF ; TEST INSTRUCTION
U 12D3, 0001,003C,0180,09E8,0000,12D4   ;2548           RC[0D]_D
U 12D4, 0000,003C,01C0,0A18,0000,12D5   ;2549           Q_R[3]                  ; GET THE EXPECTED RESULT
U 12D5, 0000,003C,0390,0800,0000,12D6   ;2550           Q_Q.RIGHT2,SI/7
U 12D6, 0001,203C,0180,09F0,0000,12D7   ;2551           RC[OE]_Q
U 12D7, 001D,2000,0180,0800,0010,12D8   ;2552           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12D8, 0000,013C,0180,0800,0000,10FA   ;2553           Z?
U 10FA, 0000,003D,0180,0800,0000,1201   ;2554   =0      ERROR1
U 10FB, 0000,003C,0180,0800,0000,10FC   ;2555           NOP
                                        ;2556   ;/////////////////////////////////////////////////////////
                                        ;2557   ;+
                                        ;2558   ; SUBTEST       7
                                        ;2559   ; SI=2
                                        ;2560   ;-
U 10FC, 0000,003D,0180,0800,0000,1205   ;2561   =0      SUBTEST
U 10FD, 0000,003C,0180,0800,0000,110A   ;2562           NOP
U 110A, 0000,003D,0180,0800,0000,1200   ;2563   =0      ERLOOP
U 110B, 0820,003C,0100,0A18,0000,12D9   ;2564           ALU_R[3],SHF/LEFT,SI/2,DK/SHF ; TEST INSTRUCTION
U 12D9, 0001,003C,0180,09E8,0000,12DA   ;2565           RC[0D]_D
U 12DA, 0000,003C,01C0,0A20,0000,12DB   ;2566           Q_R[4]                  ; GET EXPECTED RESULT
U 12DB, 0001,203C,0180,09F0,0000,12DC   ;2567           RC[OE]_Q
U 12DC, 001D,2000,0180,0800,0010,12DD   ;2568           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12DD, 0000,013C,0180,0800,0000,1110   ;2569           Z?
U 1110, 0000,003D,0180,0800,0000,1201   ;2570   =0      ERROR1
U 1111, 0000,003C,0180,0800,0000,1112   ;2571           NOP
                                        ;2572   ;/////////////////////////////////////////////////////////
                                        ;2573   ;+
                                        ;2574   ; SUBTEST       8
                                        ;2575   ; SI=3
                                        ;2576   ;-
U 1112, 0000,003D,0180,0800,0000,1205   ;2577   =0      SUBTEST
U 1113, 0000,003C,0180,0800,0000,1114   ;2578           NOP
U 1114, 0000,003D,0180,0800,0000,1200   ;2579   =0      ERLOOP
U 1115, 0820,003C,0180,0A18,0000,12DE   ;2580           ALU_R[3],SHF/LEFT,SI/3,DK/SHF ; TEST INSTRUCTION
U 12DE, 0001,003C,0180,09E8,0000,12DF   ;2581           RC[0D]_D
U 12DF, 0000,003C,01C0,0A20,0000,12E0   ;2582           Q_R[4]                  ; GET EXPECTED RESULT
```

```
U 12E0, 0001,203C,0180,09F0,0000,12E1   ;2583              RC[0E]_Q
U 12E1, 001D,2000,0180,0800,0010,12E2   ;2584              ALU_Q-D,CLK.UBCC         ; RESULT CORRECT?
U 12E2, 0000,013C,0180,0800,0000,1116   ;2585              Z?
U 1116, 0000,003D,0180,0800,0000,1201   ;2586     =0       ERROR1
U 1117, 0000,003C,0180,0800,0000,1118   ;2587              NOP
                                        ;2588     ;//////////////////////////////////////////////////////////////
                                        ;2589     ;+
                                        ;2590     ; SUBTEST        9
                                        ;2591     ; SI=5, Q31=0
                                        ;2592     ;-
U 1118, 0000,003D,0180,0800,0000,1205   ;2593     =0       SUBTEST
U 1119, 0000,003C,0180,0800,0000,111A   ;2594              NOP
U 111A, 0000,003D,0180,0800,0000,1200   ;2595     =0       ERLOOP
U 111B, 0000,003C,01F8,0800,0000,12E3   ;2596              Q_0                      ; CLEAR Q<31>
U 12E3, 0820,003C,0280,0A18,0000,12E4   ;2597              ALU_R[3],SHF/LEFT,SI/5,DK/SHF ; TEST INSTRUCTION
U 12E4, 0001,003C,0180,09E8,0000,12E5   ;2598              RC[0D]_D
U 12E5, 0000,003C,01C0,0A20,0000,12E6   ;2599              Q_R[4]                   ; GET EXPECTED RESULT
U 12E6, 0001,203C,0180,09F0,0000,12E7   ;2600              RC[0E]_Q
U 12E7, 001D,2000,0180,0800,0010,12E8   ;2601              ALU_Q-D,CLK.UBCC         ; RESULT CORRECT?
U 12E8, 0000,013C,0180,0800,0000,111C   ;2602              Z?
U 111C, 0000,003D,0180,0800,0000,1201   ;2603     =0       ERROR1
U 111D, 0000,003C,0180,0800,0000,1120   ;2604              NOP
                                        ;2605     ;//////////////////////////////////////////////////////////////
                                        ;2606     ;+
                                        ;2607     ; SUBTEST        A
                                        ;2608     ; SI=5, Q31=1
                                        ;2609     ;-
U 1120, 0000,003D,0180,0800,0000,1205   ;2610     =0       SUBTEST
U 1121, 0000,003C,0180,0800,0000,1122   ;2611              NOP
U 1122, 0000,003D,0180,0800,0000,1200   ;2612     =0       ERLOOP
U 1123, 0000,003C,01C0,0A18,0000,12E9   ;2613              Q_R[3]                   ; SET Q<31>
U 12E9, 0820,003C,0280,0A18,0000,12EA   ;2614              ALU_R[3],SHF/LEFT,SI/5,DK/SHF ; TEST INSTRUCTION
U 12EA, 0001,003C,0180,09E8,0000,12EB   ;2615              RC[0D]_D
U 12EB, 0000,003C,01C0,0A28,0000,12EC   ;2616              Q_R[5]                   ; GET EXPECTED RESULT
U 12EC, 0001,203C,0180,09F0,0000,12ED   ;2617              RC[0E]_Q
U 12ED, 001D,2000,0180,0800,0010,12EE   ;2618              ALU_Q-D,CLK.UBCC         ; RESULT CORRECT?
U 12EE, 0000,013C,0180,0800,0000,1124   ;2619              Z?
U 1124, 0000,003D,0180,0800,0000,1201   ;2620     =0       ERROR1
U 1125, 0000,003C,0180,0800,0000,1126   ;2621              NOP
                                        ;2622     ;//////////////////////////////////////////////////////////////
                                        ;2623     ;+
                                        ;2624     ; SUBTEST        B
                                        ;2625     ; SI=6
                                        ;2626     ;-
U 1126, 0000,003D,0180,0800,0000,1205   ;2627     =0       SUBTEST
U 1127, 0000,003C,0180,0800,0000,1128   ;2628              NOP
U 1128, 0000,003D,0180,0800,0000,1200   ;2629     =0       ERLOOP
U 1129, 0820,003C,0300,0A18,0000,12EF   ;2630              ALU_R[3],SHF/LEFT,SI/6,DK/SHF ; TEST INSTRUCTION
U 12EF, 0001,003C,0180,09E8,0000,12F0   ;2631              RC[0D]_D
U 12F0, 0000,003C,01C0,0A20,0000,12F1   ;2632              Q_R[4]                   ; GET THE EXPECTED RESULT
U 12F1, 0001,203C,0180,09F0,0000,12F2   ;2633              RC[0E]_Q
U 12F2, 001D,2000,0180,0800,0010,12F3   ;2634              ALU_Q-D,CLK.UBCC         ; RESULT CORRECT?
U 12F3, 0000,013C,0180,0800,0000,112A   ;2635              Z?
U 112A, 0000,003D,0180,0800,0000,1201   ;2636     =0       ERROR1
U 112B, 0000,003C,0180,0800,0000,112C   ;2637              NOP
```

```
                                        ;2638   ;//////////////////////////////////////////////////////////////////
                                        ;2639   ;+
                                        ;2640   ; SUBTEST        C
                                        ;2641   ; SI=7
                                        ;2642   ;-
U 112C, 0000,003D,0180,0800,0000,1205   ;2643   =0      SUBTEST
U 112D, 0000,003C,0180,0800,0000,1130   ;2644           NOP
U 1130, 0000,003D,0180,0800,0000,1200   ;2645   =0      ERLOOP
U 1131, 0820,003C,0380,0A18,0000,12F4   ;2646           ALU_R[3],SHF/LEFT,SI/7,DK/SHF ; TEST INSTRUCTION
U 12F4, 0001,003C,0180,09E8,0000,12F5   ;2647           RC[0D]_D
U 12F5, 0000,003C,01C0,0A28,0000,12F6   ;2648           Q_R[5]                  ; GET THE EXPECTED RESULT
U 12F6, 0001,203C,0180,09F0,0000,12F7   ;2649           RC[0E]_Q
U 12F7, 001D,2000,0180,0800,0010,12F8   ;2650           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12F8, 0000,013C,0180,0800,0000,1132   ;2651           Z?
U 1132, 0000,003D,0180,0800,0000,1201   ;2652   =0      ERROR1
U 1133, 0000,003C,0180,0800,0000,1134   ;2653           NOP
```

```
                                              .PAGE   "TEST 75        SIGN CONTROL AND BEN SS (SIGN SOURCE ) TEST"
                                        ;****************************************************************
                                        ;++
                                        ; TEST  75       SIGN CONTROL AND BEN SS (SIGN SOURCE ) TEST
                                        ;
                                        ; TEST DESCRIPTION:
                                        ;                THIS IS A TEST OF THE USGN FIELD.  A ZERO AND A ONE
                                        ;         ARE PRESENTED AT EACH OF THE INPUTS TO SS AND SD MUXES, AND
                                        ;         THE BRANCH LOGIC IS USED TO CHECK THE RESULT.  SS INPUT D6
                                        ;         IS TESTED IN SECTION 37.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;         ERROR CODE:
                                        ;                 0 => BRANCH FAILED TO BE DEASSERTED
                                        ;                 1 => BRANCH FAILED TO BE ASSERTED
                                        ;                 2 => NOT A BRANCH LOGIC FAILURE
                                        ;
                                        ;--
                                        ;****************************************************************
                                        =0
U 1134, 0000,003D,0180,0800,0000,11E9   SSTEST: NEWTST
U 1135, 0018,0038,0580,09F8,0000,1136           RC[OF]_K[.1]
                                        ;///////////////7//////////////////////////////////////////////////
                                        ;+
                                        ; SUBTEST        1
                                        ;
                                        ;         SGN/7,SGN/3,SGN/2,BEN SS TEST
                                        ;-
                                        =0
U 1136, 0000,003D,0180,0800,0000,1205   SS0:    SUBTEST
U 1137, 0003,003C,0180,09F0,0000,1138           RC[OE]_0                ;ERROR FLAG FOR BEN DEASSERTED
U 1138, 0000,003D,0180,0800,0000,1200   =0      ERLOOP
U 1139, 0000,003C,0187,0800,0000,12F9           SGN/7           ; CLEAR BOTH
U 12F9, 0000,123C,0180,0800,0000,100E           SS?             ; SS CLEAR?
U 100E, 0000,003C,0180,0800,0000,12FA   =1110   J/SS1
U 100F, 0000,003D,0180,0800,0000,1201           ERROR1          ; SS FAILED TO CLEAR OR BEN FAILED
U 12FA, 0000,003C,0182,0800,0000,12FB   SS1:    SGN/2           ; SS_SD, CHECK TO SEE IF SD CLEARED
U 12FB, 0000,123C,0180,0800,0000,109E           SS?
U 109E, 0000,003C,0180,0800,0000,12FC   =1110   J/SS2
U 109F, 0000,003D,0180,0800,0000,1201           ERROR1          ; SD FAILED TO CLEAR OR BEN FAILED
U 12FC, 0000,003C,0183,0800,0000,12FD   SS2:    SGN/3           ; SS_SS, SD_.NOT.SD
U 12FD, 0000,123C,0180,0800,0000,10AE           SS?             ; SS SHOULD STILL BE 0
U 10AE, 0000,003C,0180,0800,0000,12FE   =1110   J/SS3
U 10AF, 0000,003D,0180,0800,0000,1201           ERROR1          ; SGN/3 FAILED AT 0
U 12FE, 0018,0038,0580,09F0,0000,12FF   SS3:    RC[OE]_K[.1]    ; ERROR FLAG FOR BEN ASSERTED
U 12FF, 0000,003C,0182,0800,0000,1300           SGN/2           ; SEE IF SD WENT FROM 0->1 (SS_SD)
U 1300, 0000,123C,0180,0800,0000,10BE           SS?
U 10BE, 0000,003D,0180,0800,0000,1201   =1110   ERROR1          ; SGN/2,SGN/3,OR BEN FAILED
U 10BF, 0018,0038,0980,09F0,0000,1301           RC[OE]_K[.2]    ; ERROR FLAG FOR BEN TESTED AT 0 AND 1
U 1301, 0000,003C,0182,0800,0000,1302           SGN/2           ; SEE IF SD STAYED AT 1 DURING LAST SGN/2
U 1302, 0000,123C,0180,0800,0000,10CE           SS?
U 10CE, 0000,003D,0180,0800,0000,1201   =1110   ERROR1          ; SD SGN/2 FAILED AT 1
U 10CF, 0000,003C,0183,0800,0000,1303           SGN/3           ; SS_SS,SD_.NOT.SD
```

```
U 1303, 0000,123C,0180,0800,0000,10DE   ;2709                   SS?                     ; CHECK SS SGN/3 AT 1
U 10DE, 0000,003D,0180,0800,0000,1201   ;2710   =1110           ERROR1                  ; SS SGN/3 FAILED AT 1
U 10DF, 0000,003C,0182,0800,0000,1304   ;2711                   SGN/2                   ; SEE IF SD WENT FROM 1 -> 0
U 1304, 0000,123C,0180,0800,0000,10EE   ;2712                   SS?
U 10EE, 0000,003C,0180,0800,0000,1305   ;2713   =1110           J/SS4
U 10EF, 0000,003D,0180,0800,0000,1201   ;2714                   ERROR1                  ; SD SGN/3 FROM 1 TO 0 FAILED
U 1305, 0000,003C,0182,0800,0000,10FE   ;2715   SS4:            SGN/2                   ; SEE IF SD STAYED AT 0 DURING LAST SGN/2
U 10FE, 0000,003C,0180,0800,0000,113A   ;2716   =1110           J/SS5
U 10FF, 0000,003D,0180,0800,0000,1201   ;2717                   ERROR1                  ; SD SGN/2 FAILED AT 0
                                        ;2718   ;///////////////////////////////////////////////////////////////////////
                                        ;2719   ;+
                                        ;2720   ; SUBTEST       2
                                        ;2721   ;
                                        ;2722   ;               SGN/0,SGN/1,SGN/4 TEST
                                        ;2723   ;-
                                        ;2724   =0
U 113A, 0000,003D,0180,0800,0000,1205   ;2725   SS5:            SUBTEST
U 113B, 0018,0038,0980,09F0,0000,113C   ;2726                   RC[0E]_K[.2]            ; ERROR FLAG FOR BEN TESTED
U 113C, 0000,003D,0180,0800,0000,1200   ;2727   =0              ERLOOP
U 113D, 0000,003C,0187,0800,0000,1306   ;2728                   SGN/7                   ; CLEAR BOTH
U 1306, 0000,003C,0180,0800,0000,1307   ;2729                   SGN/0                   ; SS_SS, SD_SD
U 1307, 0000,123C,0180,0800,0000,111E   ;2730                   SS?
U 111E, 0000,003C,0180,0800,0000,1308   ;2731   =1110           J/SS6
U 111F, 0000,003D,0180,0800,0000,1201   ;2732                   ERROR1                  ; SS SGN/0 FAILED AT 0
U 1308, 0000,003C,0182,0800,0000,1309   ;2733   SS6:            SGN/2                   ; SS_SD, CHECK SD
U 1309, 0000,123C,0180,0800,0000,112E   ;2734                   SS?                     ;
U 112E, 0000,003C,0180,0800,0000,130A   ;2735   =1110           J/SS7
U 112F, 0000,003D,0180,0800,0000,1201   ;2736                   ERROR1                  ; SD SGN/0 FAILED AT 0
U 130A, 0000,003C,0184,0800,0000,130B   ;2737   SS7:            SGN/4                   ; SS_SS, SD_SS
U 130B, 0000,123C,0180,0800,0000,113E   ;2738                   SS?
U 113E, 0000,003C,0180,0800,0000,130C   ;2739   =1110           J/SS8
U 113F, 0000,003D,0180,0800,0000,1201   ;2740                   ERROR1                  ; SS SGN/4 FAILED AT 0
U 130C, 0000,003C,0182,0800,0000,130D   ;2741   SS8:            SGN/2                   ; SEE IF SD GOT SS IN LAST SGN/4
U 130D, 0000,123C,0180,0800,0000,114E   ;2742                   SS?
U 114E, 0000,003C,0180,0800,0000,130E   ;2743   =1110           J/SS9
U 114F, 0000,003D,0180,0800,0000,1201   ;2744                   ERROR1                  ; SD SGN/4 FAILED AT 0
U 130E, 0000,003C,0183,0800,0000,130F   ;2745   SS9:            SGN/3                   ; INVERT SD
U 130F, 0000,003C,0182,0800,0000,1310   ;2746                   SGN/2                   ; PUT IT IN SS
U 1310, 0000,003C,0184,0800,0000,1311   ;2747                   SGN/4                   ; SS_SS,SD_SS
U 1311, 0000,123C,0180,0800,0000,115E   ;2748                   SS?
U 115E, 0000,003D,0180,0800,0000,1201   ;2749   =1110           ERROR1                  ; SS SGN/4 FAILED AT 1
U 115F, 0000,003C,0183,0800,0000,1312   ;2750                   SGN/3                   ; INVERT SD (NOW=0), SS STILL = 1
U 1312, 0000,003C,0184,0800,0000,1313   ;2751                   SGN/4
U 1313, 0000,003C,0182,0800,0000,1314   ;2752                   SGN/2
U 1314, 0000,123C,0180,0800,0000,116E   ;2753                   SS?
U 116E, 0000,003D,0180,0800,0000,1201   ;2754   =1110           ERROR1                  ; SD SGN/4 FAILED AT 1
U 116F, 0000,003C,0180,0800,0000,1315   ;2755                   SGN/0                   ; SS_SS SHOULD STILL = 1
U 1315, 0000,123C,0180,0800,0000,117E   ;2756                   SS?
U 117E, 0000,003D,0180,0800,0000,1201   ;2757   =1110           ERROR1                  ; SS SGN/0 FAILED AT 1
U 117F, 0000,003C,0182,0800,0000,1316   ;2758                   SGN/2                   ; SEE IF SD STAYED AT 1
U 1316, 0000,123C,0180,0800,0000,118E   ;2759                   SS?
U 118E, 0000,003D,0180,0800,0000,1201   ;2760   =1110           ERROR1                  ; SD SGN/0 FAILED AT 1
U 118F, 0000,003C,0181,0800,0000,1317   ;2761                   SGN/1                   ; SD_SD
U 1317, 0000,003C,0182,0800,0000,1318   ;2762                   SGN/2
U 1318, 0000,123C,0180,0800,0000,119E   ;2763                   SS?
```

```
U 119E, 0000,003D,0180,0800,0000,1201   ;2764   =1110   ERROR1            ; SD SGN/0 FAILED AT 1
U 119F, 0000,003C,0183,0800,0000,1319   ;2765           SGN/3             ; INVERT SD (NOW = 0)
U 1319, 0000,003C,0181,0800,0000,131A   ;2766           SGN/1
U 131A, 0000,003C,0182,0800,0000,131B   ;2767           SGN/2
U 131B, 0000,123C,0180,0800,0000,11AE   ;2768           SS?
U 11AE, 0000,003C,0180,0800,0000,1140   ;2769   =1110   J/SS10
U 11AF, 0000,003D,0180,0800,0000,1201   ;2770           ERROR1            ; SD SGN/1 FAILED AT 0
                                        ;2771   ;///////////////////////////////////////////////////////////////////////
                                        ;2772   ;+
                                        ;2773   ; SUBTEST       3
                                        ;2774   ;
                                        ;2775   ;       ALU INPUTS TEST, SGN/1,SGN/5,SGN/6
                                        ;2776   ;-
                                        ;2777   =0
U 1140, 0000,003D,0180,0800,0000,1205   ;2778   SS10:   SUBTEST
U 1141, 0018,0038,0980,09F0,0000,1142   ;2779           RC[OE]_K[.2]      ; ERROR FLAG FOR BEN TESTED
U 1142, 0000,003D,0180,0800,0000,1200   ;2780   =0      ERLOOP
U 1143, 0018,0038,1981,0800,0000,131C   ;2781           ALU_O(K),SGN/1    ; SS_ALU 15, SD_SD
U 131C, 0000,123C,0180,0800,0000,11BE   ;2782           SS?
U 11BE, 0000,003C,0180,0800,0000,131D   ;2783   =1110   J/SS11
U 11BF, 0000,003D,0180,0800,0000,1201   ;2784           ERROR1            ; SS SGN/1 (ALU 15) FAILED AT 0
U 131D, 0018,0038,C181,0800,0000,131E   ;2785   SS11:   ALU_K[.FFFF],SGN/1
U 131E, 0000,123C,0180,0800,0000,11CE   ;2786           SS?
U 11CE, 0000,003D,0180,0800,0000,1201   ;2787   =1110   ERROR1            ; SS SGN/1 (ALU 15) FAILED AT 1
U 11CF, 0018,0038,1986,0800,0000,131F   ;2788           ALU_O(K),SGN/6    ; SD_ALU 15
U 131F, 0000,003C,0182,0800,0000,1320   ;2789           SGN72             ; SS_SD
U 1320, 0000,123C,0180,0800,0000,11DE   ;2790           SS?
U 11DE, 0000,003C,0180,0800,0000,1321   ;2791   =1110   J/SS12
U 11DF, 0000,003D,0180,0800,0000,1201   ;2792           ERROR1            ; SD SGN/6 (ALU 15) FAILED AT 0
U 1321, 0018,0038,C186,0800,0000,1322   ;2793   SS12:   ALU_K[.FFFF],SGN/6
U 1322, 0000,003C,0182,0800,0000,1323   ;2794           SGN72
U 1323, 0000,123C,0180,0800,0000,11EE   ;2795           SS?
U 11EE, 0000,003D,0180,0800,0000,1201   ;2796   =1110   ERROR1            ; SD SGN/6 FAILED AT 1
U 11EF, 0018,0038,1985,0800,0000,1324   ;2797           ALU_O(K),SGN/5    ; SD_ALU 15
U 1324, 0000,003C,0182,0800,0000,1325   ;2798           SGN72
U 1325, 0000,123C,0180,0800,0000,11FE   ;2799           SS?
U 11FE, 0000,003C,0180,0800,0000,1326   ;2800   =1110   J/SS13
U 11FF, 0000,003D,0180,0800,0000,1201   ;2801           ERROR1            ; SD SGN/5 (ALU 15) FAILED AT 0
U 1326, 0018,0038,C185,0800,0000,1327   ;2802   SS13:   ALU_K[.FFFF],SGN/5 ;
U 1327, 0000,003C,0182,0800,0000,1328   ;2803           SGN72
U 1328, 0000,123C,0180,0800,0000,120E   ;2804           SS?
U 120E, 0000,003D,0180,0800,0000,1201   ;2805   =1110   ERROR1            ; SD SGN/5 (ALU 15) FAILED AT 1
U 120F, 0000,003C,0180,0800,0000,1144   ;2806           NOP
                                        ;2807   ;///////////////////////////////////////////////////////////////////////
                                        ;2808   ;+
                                        ;2809   ; SUBTEST       4
                                        ;2810   ;
                                        ;2811   ;       ALU 15 .XOR.SS (SGN/5) TEST
                                        ;2812   ;-
                                        ;2813   =0
U 1144, 0000,003D,0180,0800,0000,1205   ;2814   SS14:   SUBTEST
U 1145, 0018,0038,0980,09F0,0000,1146   ;2815           RC[OE]_K[.2]      ; ERROR FALG FOR BEN TESTED
U 1146, 0000,003D,0180,0800,0000,1200   ;2816   =0      ERLOOP
U 1147, 0000,003C,0187,0800,0000,1329   ;2817           SGN/7             ; CLEAR BOTH
U 1329, 0018,0038,1985,0800,0000,132A   ;2818           ALU_O(K),SGN/5    ; TRY 00 TO XOR GATE
```

```
U 132A, 0000,123C,0180,0800,0000,121E   ;2819            SS?
U 121E, 0000,003C,0180,0800,0000,132B   ;2820   =1110    J/SS15
U 121F, 0000,003D,0180,0800,0000,1201   ;2821            ERROR1           ; SS SGN/5 (ALU 15 .XOR.SS) FAILED, 00 IN
U 132B, 0018,0038,C185,0800,0000,132C   ;2822   SS15:    ALU_K[.FFFF],SGN/5 ; TRY 10 TO XOR GATE
U 132C, 0000,123C,0180,0800,0000,122E   ;2823            SS?
U 122E, 0000,003D,0180,0800,0000,1201   ;2824   =1110    ERROR1           ; SGN/5 FAILED WITH 1 AND 0 INPUTS TO XOR
U 122F, 0018,0038,1985,0800,0000,132D   ;2825            ALU_O(K),SGN/5   ; TRY 01 TO XOR GATE
U 132D, 0000,123C,0180,0800,0000,123E   ;2826            SS?
U 123E, 0000,003D,0180,0800,0000,1201   ;2827   =1110    ERROR1           ; SGN/5 FAILED WITH 0 AND 1 INPUTS TO XOR
U 123F, 0018,0038,C185,0800,0000,132E   ;2828            ALU_K[.FFFF],SGN/5 ; TRY 11 TO XOR GATE
U 132E, 0000,123C,0180,0800,0000,124E   ;2829            SS?
U 124E, 0000,003C,0180,0800,0000,132F   ;2830   =1110    J/SSDONE
U 124F, 0000,003D,0180,0800,0000,1201   ;2831            ERROR1           ; SGN/5 FAILED WITH 11 INPUTS TO XOR
U 132F, 0000,003C,0180,0800,0000,1148   ;2832   SSDONE:  NOP
```

```
                                        ;2833           .PAGE   "TEST 76        BMX/PACKED.FL TEST"
                                        ;2834   ;*******************************************************
                                        ;2835   ;++
                                        ;2836   ; TEST  76      BMX/PACKED.FL
                                        ;2837   ;
                                        ;2838   ; TEST DESCRIPTION
                                        ;2839   ;       THIS IS A TEST OF THE BMX FUNCTION WHICH PACKS
                                        ;2840   ;       A FLOATING POINT NUMBER TOGETHER FROM THE
                                        ;2841   ;       EXPONENT AT THE EALU OUTPUTS, THE FRACTION IN
                                        ;2842   ;       THE D REGISTER AND THE SIGN IN SD.
                                        ;2843   ;       TEST DATA IS SUCH THAT A 0 IS FLOATED THROUGH 1'S
                                        ;2844   ;       AND A 1 IS FLOATED THROUGH 0'S IN THE RESULT.
                                        ;2845   ;
                                        ;2846   ; LOGIC DESCRIPTION
                                        ;2847   ;
                                        ;2848   ; ERROR DESCRIPTION
                                        ;2849   ;       EXPECTED RESULT
                                        ;2850   ;       ACTUAL RESULT
                                        ;2851   ;
                                        ;2852   ;--
                                        ;2853   ;*******************************************************
                                        ;2854   =0
U 1148, 0000,003D,0180,0800,0000,11E9   ;2855   BMXFL:  NEWTST
U 1149, 0018,0038,8D80,0A98,0000,1330   ;2856           R[3]_K[.1F]             ; SET UP A COUNTER FOR THE TEST
U 1330, 0018,0038,0980,09F8,0000,114A   ;2857           RC[OF]_K[.2]
U 114A, 0000,003D,0180,0800,0000,1200   ;2858   =0      ERLOOP
U 114B, 0000,003C,0180,0A18,0082,1331   ;2859   BMX0:   SC_R[3]                 ; USE THE MASK TO GENERATE
U 1331, 0803,001C,01C0,09F0,0000,1332   ;2860           ALU_NOT.MASK,D_ALU,RC[OE]_ALU,Q_ALU ; THE TEST DATA AND THEN
U 1332, 0901,003C,0186,0800,0083,1333   ;2861           ALU_D,SC_ALU(EXP),D_ALU(FRAC),SGN/6 ; SAVE PIECES OF IT IN D, SD AND SC
U 1333, 0500,003C,0180,0800,0000,1334   ;2862           D_D.LEFT,SI/ZERO        ; GET RID OF GUARD BIT
U 1334, 0808,0038,0180,09E8,0000,1335   ;2863           BMX/PACKED.FL,ALU/B,D_ALU,RC[OD]_ALU ; TEST INSTRUCTION
U 1335, 001D,2000,0180,0800,0010,1336   ;2864           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1336, 0000,013C,0180,0800,0000,114C   ;2865           Z?
U 114C, 0000,003D,0180,0800,0000,1201   ;2866   =0      ERROR1
                                        ;2867   ; NOW TEST THE COMPLEMENT PATTERN:
U 114D, 0800,0038,01C0,09E8,0000,1337   ;2868           ALU_MASK,D_ALU,RC[OD]_ALU,Q_ALU ; GET TEST DATA
U 1337, 0901,003C,0186,0800,0083,1338   ;2869           ALU_D,SC_ALU(EXP),D_ALU(FRAC),SGN/6 ; SAVE IT
U 1338, 0500,003C,0180,0800,0000,1339   ;2870           D_D.LEFT,SI/ZERO        ; GET RID OF GUARD BIT
U 1339, 0808,0038,0180,09F0,0000,133A   ;2871           BMX/PACKED.FL,ALU/B,D_ALU,RC[OE]_ALU ; TEST INSTRUCTION
U 133A, 001D,2000,0180,0800,0010,133B   ;2872           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 133B, 0000,013C,0180,0800,0000,1150   ;2873           Z?
U 1150, 0000,003D,0180,0800,0000,1201   ;2874   =0      ERROR1
U 1151, 0000,003C,0180,0A18,0010,133C   ;2875           ALU_R[3],CLK.UBCC       ; SEE IF TEST COMPLETED.
U 133C, 0000,013C,0180,0800,0000,1152   ;2876           Z?
U 1152, 0018,0000,0580,0A98,0000,114B   ;2877   =0      R[3]_LA-K[.1],J/BMX0    ; IF NOT, DECREMENT COUNTER
                                        ;2878                                   ; AND CONTINUE
U 1153, 0000,003C,0180,0800,0000,1156   ;2879           NOP
```

```
                                               .PAGE   "TEST 77       BEN ALU.N TEST"
                                       ;*********************************************************
                                       ;++
                                       ; TEST  77      BEN ALU.N TEST
                                       ;
                                       ; TEST DESCRIPTION
                                       ;       THIS IS A TEST OF THE UBRANCH CONDITION CODE BIT N.
                                       ;       IT IS TESTED IN EACH OF THE DATA TYPES: LONG,
                                       ;       WORD AND BYTE.
                                       ;
                                       ; LOGIC DESCRIPTION
                                       ;
                                       ; ERROR DESCRIPTION
                                       ;
                                       ;--
                                       ;*********************************************************
                                       =0
U 1156, 0000,003D,0180,0800,0000,11E9  NBIT:   NEWTST
U 1157, 0000,003C,0180,0800,0000,1158          NOP
                                       ;///////////////////////////////////////////////////////////////
                                       ;+
                                       ; SUBTEST       1
                                       ; TEST DT/LONG AND ALU<31>=0
                                       ;-
U 1158, 0000,003D,0180,0800,0000,1205  =0      SUBTEST
U 1159, 0000,003C,0180,0800,0000,115A          NOP
U 115A, 0000,003D,0180,0800,0000,1200  =0      ERLOOP
U 115B, 0000,003C,8D80,0800,0084,733D          SC_K[.1F]                ; USE MASK TO GET ALU=7FFFFFFF
U 133D, 0000,0038,0180,0800,0010,133E          ALU_MASK,CLK.UBCC,DT/LONG ; LOAD UBCC
U 133E, 0000,1B3C,0180,0800,0000,1047          ALU.N?                   ; TEST BEN.
U 1047, 0000,003C,0180,0800,0000,115C  =0111   J/NB1
U 104F, 0000,003D,0180,0800,0000,1201          ERROR1                   ; TEST FAILED
                                       ;///////////////////////////////////////////////////////////////
                                       ;+
                                       ; SUBTEST       2
                                       ; TEST DT/LONG AND ALU<31>=1
                                       ;-
                                       =0
U 115C, 0000,003D,0180,0800,0000,1205  NB1:    SUBTEST
U 115D, 0000,003C,0180,0800,0000,1160          NOP
U 1160, 0000,003D,0180,0800,0000,1200  =0      ERLOOP
U 1161, 0000,003C,8D80,0800,0084,733F          SC_K[.1F]                ; USE MASK TO GET DATA
U 133F, 0803,001C,0180,0800,0000,1340          ALU_NOT.MASK,D_ALU
U 1340, 0001,003C,0180,0800,0010,1341          ALU_D,CLK.UBCC,DT/LONG   ; LOAD UBCC
U 1341, 0000,1B3C,0180,0800,0000,1057          ALU.N?                   ; TEST BEN ALU.N
U 1057, 0000,003D,0180,0800,0000,1201  =0111   ERROR1                   ; REPORT FAILURE
U 105F, 0000,003C,0180,0800,0000,1162          NOP
                                       ;///////////////////////////////////////////////////////////////
                                       ;+
                                       ; SUBTEST       3
                                       ; TEST DT/WORD AND ALU<15>=0
                                       ;-
U 1162, 0000,003D,0180,0800,0000,1205  =0      SUBTEST
U 1163, 0000,003C,0180,0800,0000,1164          NOP
U 1164, 0000,003D,0180,0800,0000,1200  =0      ERLOOP
```

```
U 1165, 0000,003C,6180,0800,0084,7342   ;2935           SC_K[.F]                  ; USE MASK TO GENERATE DATA
U 1342, 0000,4038,0180,0800,0010,1343   ;2936           ALU_MASK,CLK.UBCC,DT/WORD ; LOAD UBCC
U 1343, 0000,1B3C,0180,0800,0000,1257   ;2937           ALU.N?                    ; TEST BEN ALU.N
U 1257, 0000,003C,0180,0800,0000,1166   ;2938   =0111   J/NB2
U 125F, 0000,003D,0180,0800,0000,1201   ;2939           ERROR1                    ; REPORT ERROR
                                        ;2940   ;//////////////////////////////////////////////////////////////
                                        ;2941   ;+
                                        ;2942   ; SUBTEST       4
                                        ;2943   ; TEST DT/WORD AND ALU<15>=1
                                        ;2944   ;-
                                        ;2945   =0
U 1166, 0000,003D,0180,0800,0000,1205   ;2946   NB2:    SUBTEST
U 1167, 0000,003C,0180,0800,0000,1168   ;2947           NOP
U 1168, 0000,003D,0180,0800,0000,1200   ;2948   =0      ERLOOP
U 1169, 0000,003C,6180,0800,0084,7344   ;2949           SC_K[.F]                  ; USE MASK TO GENERATE DATA
U 1344, 0803,001C,0180,0800,0000,1345   ;2950           ALU_NOT.MASK,D_ALU
U 1345, 0001,403C,0180,0800,0010,1346   ;2951           ALU_D,CLK.UBCC,DT/WORD    ; LOAD UBCC
U 1346, 0000,1B3C,0180,0800,0000,1267   ;2952           ALU.N?                    ; TEST BEN ALU.N
U 1267, 0000,003D,0180,0800,0000,1201   ;2953   =0111   ERROR1                    ; REPORT ERRCR
U 126F, 0000,003C,0180,0800,0000,116A   ;2954           NOP
                                        ;2955   ;//////////////////////////////////////////////////////////////
                                        ;2956   ;+
                                        ;2957   ; SUBTEST       5
                                        ;2958   ; TEST DT/BYTE AND ALU<7>=0
                                        ;2959   ;-
U 116A, 0000,003D,0180,0800,0000,1205   ;2960   =0      SUBTEST
U 116B, 0000,003C,0180,0800,0000,116C   ;2961           NOP
U 116C, 0000,003D,0180,0800,0000,1200   ;2962   =0      ERLOOP
U 116D, 0000,003C,5D80,0800,0084,7347   ;2963           SC_K[.7]                  ; USE THE MASK TO GENERATE THE DATA
U 1347, 0000,8038,0180,0800,0010,1348   ;2964           ALU_MASK,CLK.UBCC,DT/BYTE ; LOAD UBCC
U 1348, 0000,1B3C,0180,0800,0000,1277   ;2965           ALU.N?                    ; TEST BEN ALU.N
U 1277, 0000,003C,0180,0800,0000,1170   ;2966   =0111   J/NB3
U 127F, 0000,003D,0180,0800,0000,1201   ;2967           ERROR1                    ; REPORT THE ERROR
                                        ;2968   ;//////////////////////////////////////////////////////////////
                                        ;2969   ;+
                                        ;2970   ; SUBTEST       6
                                        ;2971   ; TEST DT/BYTE AND ALU<7>=1
                                        ;2972   ;-
                                        ;2973   =0
U 1170, 0000,003D,0180,0800,0000,1205   ;2974   NB3:    SUBTEST
U 1171, 0000,003C,0180,0800,0000,1172   ;2975           NOP
U 1172, 0000,003D,0180,0800,0000,1200   ;2976   =0      ERLOOP
U 1173, 0000,003C,5D80,0800,0084,7349   ;2977           SC_K[.7]                  ; USE MASK TO GENERATE THE DATA
U 1349, 0803,001C,0180,0800,0000,134A   ;2978           ALU_NOT.MASK,D_ALU
U 134A, 0001,803C,0180,0800,0010,134B   ;2979           ALU_D,CLK.UBCC,DT/BYTE    ; LOAD UBCC
U 134B, 0000,1B3C,0180,0800,0000,1287   ;2980           ALU.N?                    ; TEST BEN ALU.N
U 1287, 0000,003D,0180,0800,0000,1201   ;2981   =0111   ERROR1                    ; REPORT ERROR
U 128F, 0000,003C,0180,0800,0000,1174   ;2982           NOP
```

```
                                         ;2983          .PAGE   "TEST 78        WRITE RAB WITH DT/BYTE TEST"
                                         ;2984   ;*********************************************************
                                         ;2985   ;++
                                         ;2986   ; TEST  78      WRITE RAB WITH DT/BYTE TEST
                                         ;2987   ;
                                         ;2988   ; TEST DESCRIPTION
                                         ;2989   ;      THIS IS A TEST OF THE DATA TYPE DEPENDENCY OF
                                         ;2990   ;      THE WRITE RA AND RB SCRATCH PAD FUNCTIONS.
                                         ;2991   ;      DT=BYTE IS TESTED HERE.
                                         ;2992   ;
                                         ;2993   ; LOGIC DESCRIPTION
                                         ;2994   ;
                                         ;2995   ; ERROR DESCRIPTION
                                         ;2996   ;      EXPECTED DATA IN R[0]
                                         ;2997   ;      GOT DATA IN R[0]
                                         ;2998   ;
                                         ;2999   ;--
                                         ;3000   ;*********************************************************
                                         ;3001   =0
U 1174, 0000,003D,0180,0800,0000,11E9    ;3002   RABDTB: NEWTST
U 1175, 0018,0038,0980,09F8,0000,134C    ;3003          RC[0F]_K[.2]
U 134C, 001B,0000,0580,0A80,0000,134D    ;3004          ALU_0-K[.1],R[0]_ALU     ; R[0]=FFFFFFFF
U 134D, 0018,8038,1980,0A80,0000,134E    ;3005          ALU_0(K),R[0]_ALU,DT/BYTE ; R[0]=FFFFFF00, TEST INSTRUCTION
U 134E, 001B,001C,49C0,09F0,0000,134F    ;3006          ALU_NOT.K[.FF],Q_ALU,RC[0E]_ALU ; GET EXPECTED DATA
U 134F, 0800,003C,0180,0A00,0000,1350    ;3007          D_R[0]
U 1350, 0001,003C,0180,09E8,0000,1351    ;3008          RC[0D]_D
U 1351, 001D,2000,0180,0800,0010,1352    ;3009          ALU_Q-D,CLK.UBCC         ; IS RA RESULT CORRECT?
U 1352, 0000,013C,0180,0800,0000,1176    ;3010          Z?
U 1176, 0000,003D,0180,0800,0000,1201    ;3011   =0     ERROR1
U 1177, 080C,0038,0180,0800,0000,1353    ;3012          ALU_LB,D_ALU
U 1353, 0001,003C,0180,09E8,0000,1354    ;3013          RC[0D]_D
U 1354, 001D,2000,0180,0800,0010,1355    ;3014          ALU_Q-D,CLK.UBCC         ; IS RB RESULT CORRECT?
U 1355, 0000,013C,0180,0800,0000,1178    ;3015          Z?
U 1178, 0000,003D,0180,0800,0000,1201    ;3016   =0     ERROR1
U 1179, 0000,003C,0180,0800,0000,117A    ;3017          NOP
U 117A, 0000,003D,0180,0800,0000,1200    ;3018   =0     ERLOOP
U 117B, 0018,0038,49C0,09F0,0000,1356    ;3019          Q_K[.FF],RC[0E]_K[.FF]   ; GET EXPECTED RESULT
U 1356, 0003,003C,0180,0A80,0000,1357    ;3020          R[0]_0                   ; R[0]=00000000
U 1357, 081B,0000,0580,0800,0000,1358    ;3021          ALU_0-K[.1],D_ALU
U 1358, 0001,803C,0180,0A80,0000,1359    ;3022          ALU_D,R[0]_ALU,DT/BYTE   ; R[0]=000000FF
U 1359, 0800,003C,0180,0A00,0000,135A    ;3023          D_R[0]
U 135A, 0001,003C,0180,09E8,0000,135B    ;3024          RC[0D]_D
U 135B, 001D,2000,0180,0800,0010,135C    ;3025          ALU_Q-D,CLK.UBCC                   ; CHECK RA[0]
U 135C, 0000,013C,0180,0800,0000,117C    ;3026          Z?
U 117C, 0000,003D,0180,0800,0000,1201    ;3027   =0     ERROR1
U 117D, 080C,0038,0180,0800,0000,135D    ;3028          ALU_LB,D_ALU
U 135D, 0001,003C,0180,09E8,0000,135E    ;3029          RC[0D]_D
U 135E, 001D,2000,0180,0800,0010,135F    ;3030          ALU_Q-D,CLK.UBCC         ; CHECK RB[0]
U 135F, 0000,013C,0180,0800,0000,1180    ;3031          Z?
U 1180, 0000,003D,0180,0800,0000,1201    ;3032   =0     ERROR1
U 1181, 0000,003C,0180,0800,0000,1182    ;3033          NOP
```

```
                                                ;3034           .PAGE   "TEST 79        WRITE RAB WITH DT/WORD TEST"
                                                ;3035   ;*********************************************************
                                                ;3036   ;++
                                                ;3037   ; TEST  79      WRITE RAB WITH DT/WORD TEST
                                                ;3038   ;
                                                ;3039   ; TEST DESCRIPTION
                                                ;3040   ;       THIS IS A TEST OF THE DATA TYPE DEPENDENCY OF
                                                ;3041   ;       THE WRITE RA AND RB SCRATCH PAD FUNCTIONS.
                                                ;3042   ;       DT=WORD IS TESTED HERE.
                                                ;3043   ;
                                                ;3044   ; LOGIC DESCRIPTION
                                                ;3045   ;
                                                ;3046   ; ERROR DESCRIPTION
                                                ;3047   ;       EXPECTED RESULT (IN R[0])
                                                ;3048   ;       ACTUAL RESULT (IN R[0])
                                                ;3049   ;
                                                ;3050   ;--
                                                ;3051   ;*********************************************************
                                                ;3052   =0
U 1182, 0000,003D,0180,0800,0000,11E9           ;3053   RABDTW: NEWTST
U 1183, 0018,0038,0980,09F8,0000,1360           ;3054           RC[0F]_K[.2]
U 1360, 001B,0000,0580,0A80,0000,1361           ;3055           ALU_0-K[.1],R[0]_ALU     ; R[0]=FFFFFFFF
U 1361, 0018,4038,1980,0A80,0000,1362           ;3056           ALU_0(K),R[0]_ALU,DT/WORD ; R[0]=FFFF0000
U 1362, 001B,001C,C1C0,09F0,0000,1363           ;3057           ALU_NOT.K[.FFFF],Q_ALU,RC[0E]_ALU
U 1363, 0800,003C,0180,0A00,0000,1364           ;3058           D_R[0]
U 1364, 0001,003C,0180,09E8,0000,1365           ;3059           RC[0D]_D
U 1365, 001D,2000,0180,0800,0010,1366           ;3060           ALU_Q-D,CLK.UBCC         ; CHECK RA[0]
U 1366, 0000,013C,0180,0800,0000,1184           ;3061           Z?
U 1184, 0000,003D,0180,0800,0000,1201           ;3062   =0      ERROR1
U 1185, 080C,0038,0180,0800,0000,1367           ;3063           ALU_LB,D_ALU
U 1367, 0001,003C,0180,09E8,0000,1368           ;3064           RC[0D]_D
U 1368, 001D,2000,0180,0800,0010,1369           ;3065           ALU_Q-D,CLK.UBCC         ; CHECK RB[0]
U 1369, 0000,013C,0180,0800,0000,1186           ;3066           Z?
U 1186, 0000,003D,0180,0800,0000,1201           ;3067   =0      ERROR1
U 1187, 0000,003C,0180,0800,0000,1188           ;3068           NOP
U 1188, 0000,003D,0180,0800,0000,1200           ;3069   =0      ERLOOP
U 1189, 0018,0038,C1C0,09F0,0000,136A           ;3070           Q_K[.FFFF],RC[0E]_K[.FFFF] ; GET EXPECTED RESULT
U 136A, 0003,003C,0180,0A80,0000,136B           ;3071           R[0]_0
U 136B, 081B,0000,0580,0800,0000,136C           ;3072           ALU_0-K[.1],D_ALU
U 136C, 0001,403C,0180,0A80,0000,136D           ;3073           ALU_D,R[0]_ALU,DT/WORD  ; R[0]=0000FFFF
U 136D, 0800,003C,0180,0A00,0000,136E           ;3074           D_R[0]
U 136E, 0001,003C,0180,09E8,0000,136F           ;3075           RC[0D]_D
U 136F, 001D,2000,0180,0800,0010,1370           ;3076           ALU_Q-D,CLK.UBCC         ; CHECK RA[0]
U 1370, 0000,013C,0180,0800,0000,118A           ;3077           Z?
U 118A, 0000,003D,0180,0800,0000,1201           ;3078   =0      ERROR1
U 118B, 080C,0038,0180,0800,0000,1371           ;3079           ALU_LB,D_ALU
U 1371, 0001,003C,0180,09E8,0000,1372           ;3080           RC[0D]_D
U 1372, 001D,2000,0180,0800,0010,1373           ;3081           ALU_Q-D,CLK.UBCC         ; CHECK RB[0]
U 1373, 0000,013C,0180,0800,0000,118C           ;3082           Z?
U 118C, 0000,003D,0180,0800,0000,1201           ;3083   =0      ERROR1
U 118D, 0000,003C,0180,0800,0000,1190           ;3084           NOP
```

```
                                                   .PAGE   "TEST 7A       SC AS ADDRESS SOURCE FOR RC REGISTERS TEST"
                                           ;*********************************************************
                                           ;++
                                           ; TEST  7A      SC AS ADDRESS SOURCE FOR RC REGISTERS TEST
                                           ;
                                           ; TEST DESCRIPTION
                                           ;       THIS IS A DUAL ADDRESSING TEST OF THE RC SCRATCH PADS
                                           ;       USING THE SC AS THE ADDRESS SOURCE.
                                           ;
                                           ; LOGIC DESCRIPTION
                                           ;
                                           ; ERROR DESCRIPTION
                                           ;       EXPECTED DATA
                                           ;       ACTUAL DATA
                                           ;       REGISTER ADDRESS
                                           ;
                                           ;--
                                           ;*********************************************************
                                           =0
U 1190, 0000,003D,0180,0800,0000,11E9      DARC:   NEWTST
U 1191, 0018,0038,6180,0A98,0000,1192              R[3]_K[.F]
U 1192, 0000,003D,0180,0800,0000,1200      =0      ERLOOP
U 1193, 0800,003C,0180,0A18,0082,1374      DARC1:  SC_R[3],D_R[3]          ; WRITE ADDRESS OF REGISTER IN REG
U 1374, 0001,003C,0180,0838,0000,1194              ALU_D,RC(SC)_ALU
U 1194, 0000,193D,0180,0800,0000,1080      =0      D3-0?,CALL,J7LTCHRC     ; GO READ THE REGISTER BACK
U 1195, 0011,0000,0180,0800,0010,1375              ALU_D[A-B]LC,CLK.UBCC   ; IS IT CORRECT?
U 1375, 0000,013C,0180,0800,0000,1196              Z?
U 1196, 0000,003C,0180,0800,0000,1376      =0      J/DARC15
U 1197, 0000,003C,0180,0800,0000,137A              J/DARC16
U 1376, 0018,0038,0D80,09F8,0000,1377      DARC15: RC[0F]_K[.3]
U 1377, 0001,003C,0180,09F0,0000,1378              RC[0E]_D
U 1378, 0010,0038,0180,09E8,0000,1379              RC[0D]_LC
U 1379, 0001,003D,0180,09E0,0000,1201              RC[0C]_D,ERROR1         ; REPORT ERROR
U 137A, 0000,003C,0180,0A18,0010,137B      DARC16: ALU_R[3],CLK.UBCC
U 137B, 0000,013C,0180,0800,0000,1198              Z?
U 1198, 0018,0000,0580,0A98,0000,1193      =0      R[3]_LA-K[.1],J/DARC1
U 1199, 0018,0038,6180,0A98,0000,119A              R[3]_K[.F]
U 119A, 0000,003D,0180,0800,0000,1200      =0      ERLOOP
U 119B, 0800,^03C,0180,0A18,0082,137C      DARC2:  SC_R[3],D_R[3]          ; READ THE ADDRESS OF EACH
U 137C, 0000,003C,0180,0830,0000,137D              LC_RC(SC)               ; REGISTER OUT OF EACH REGISTER.
U 137D, 0011,0000,0180,0800,0010,137E              ALU_D[A-B]LC,CLK.UBCC   ; IS IT CORRECT?
U 137E, 0000,013C,0180,0800,0000,119C              Z?
U 119C, 0000,003C,0180,0800,0000,137F      =0      J/DARC25
U 119D, 0000,003C,0180,0800,0000,1383              J/DARC26
U 137F, 0018,0038,0D80,09F8,0000,1380      DARC25: RC[0F]_K[.3]
U 1380, 0001,003C,0180,09F0,0000,1381              RC[0E]_D
U 1381, 0010,0038,0180,09E8,0000,1382              RC[0D]_LC
U 1382, 0001,003D,0180,09E0,0000,1201              RC[0C]_D,ERROR1         ; REPORT ERROR
U 1383, 0001,0028,0180,0838,0000,1384      DARC26: ALU_NOT.D,RC(SC)_ALU    ; WRITE THE COMPLEMENT OF EACH ADDRESS
U 1384, 0000,003C,0180,0A18,0010,1385              ALU_R[3],CLK.UBCC       ; IN EACH REGISTER
U 1385, 0000,013C,0180,0800,0000,11A0              Z?
U 11A0, 0018,0000,0580,0A98,0000,119B      =0      R[3]_LA-K[.1],J/DARC2
U 11A1, 0018,0038,6180,0A98,0000,11A2              R[3]_K[.F]
U 11A2, 0000,003D,0180,0800,0000,1200      =0      ERLOOP
U 11A3, 0800,003C,0180,0A18,0082,1386      DARC3:  SC_R[3],D_R[3]          ; READ THE COMPLEMENT OF
```

```
U 1386, 0000,003C,0180,0830,0000,1387   ;3140           LC_RC(SC)               ; EACH REGISTER'S ADDRESS
                                        ;3141                                   ; OUT OF EACH REGISTER.
U 1387, 0011,0010,0180,0800,0010,1388   ;3142           ALU_D[A+B+1]LC,CLK.UBCC ; IS IT CORRECT?
U 1388, 0000,013C,0180,0800,0000,11A4   ;3143           Z?
U 11A4, 0000,003C,0180,0800,0000,1389   ;3144   =0      J/DARC35
U 11A5, 0000,003C,0180,0800,0000,138D   ;3145           J/DARC36
U 1389, 0018,0038,0D80,09F8,0000,138A   ;3146   DARC35: RC[0F]_K[.3]
U 138A, 0001,0028,0180,09F0,0000,138B   ;3147           ALU_NOT.D,RC[0E]_ALU
U 138B, 0010,0038,0180,09E8,0000,138C   ;3148           RC[0D]_LC
U 138C, 0001,003D,0180,09E0,0000,1201   ;3149           RC[0C]_D,ERROR1
U 138D, 0000,003C,0180,0A18,0010,138E   ;3150   DARC36: ALU_R[3],CLK.UBCC
U 138E, 0000,013C,0180,0800,0000,11A6   ;3151           Z?
U 11A6, 0018,0000,0580,0A98,0000,11A3   ;3152   =0      R[3]_LA-K[.1],J/DARC3
U 11A7, 0000,003C,0180,0800,0000,11A8   ;3153           NOP
```

```
                                        ;3154           .PAGE   "TEST 7B        RA AND RB ADDRESSED BY SC TEST"
                                        ;3155   ;*******************************************************
                                        ;3156   ;++
                                        ;3157   ; TEST  7B      RA AND RB ADDRESSED BY SC TEST
                                        ;3158   ;
                                        ;3159   ; TEST DESCRIPTION
                                        ;3160   ;       THIS IS A DUAL ADDRESSING TEST OF THE RA AND RB SCRATCH PADS
                                        ;3161   ;       USING THE SC AS THE ADDRESS SOURCE.
                                        ;3162   ;
                                        ;3163   ; LOGIC DESCRIPTION
                                        ;3164   ;
                                        ;3165   ; ERROR DESCRIPTION
                                        ;3166   ;       EXPECTED DATA
                                        ;3167   ;       ACTUAL DATA
                                        ;3168   ;       REGISTER ADDRESS
                                        ;3169   ;
                                        ;3170   ;--
                                        ;3171   ;*******************************************************
                                        ;3172   =0
U 11A8, 0000,003D,0180,0800,0000,11E9   ;3173   DARAB:  NEWTST
U 11A9, 0018,0038,0D80,09F8,0000,138F   ;3174           RC[0F]_K[.3]
U 138F, 0018,0038,6180,0998,0000,11AA   ;3175           RC[3]_K[.F]
U 11AA, 0000,003D,0180,0800,0000,1200   ;3176   =0      ERLOOP
U 11AB, 0810,0038,0180,0918,0082,1390   ;3177   DARAB1: SC_RC[3],D_RC[3]        ; WRITE THE ADDRESS OF THE
U 1390, 0001,003C,0180,09F0,0000,1391   ;3178           RC[0E]_D
U 1391, 0001,003C,0180,09E0,0000,1392   ;3179           RC[0C]_D
U 1392, 0001,003C,0180,08E8,0000,11AC   ;3180           ALU_D,R(SC)_ALU         ; REGISTER IN THE REGISTER
U 11AC, 0000,193D,0180,0800,0000,1070   ;3181   =0      D3-0?,CALL,J/LTCHAB     ; READ THE REGISTER
U 11AD, 001C,2000,0180,0800,0010,1393   ;3182           ALU_LA[A-B]D,CLK.UBCC   ; IS RA(SC) CORRECT?
U 1393, 0000,013C,0180,0800,0000,11B0   ;3183           Z?
U 11B0, 0000,003D,0180,09E8,0000,1201   ;3184   =0      ERROR1,RC[0D]_LA
U 11B1, 000D,0000,0180,0800,0010,1394   ;3185           ALU_D[A-B]LB,CLK.UBCC   ; IS LB CORRECT?
U 1394, 0000,013C,0180,0800,0000,11B2   ;3186           Z?
U 11B2, 000C,0039,0180,09E8,0000,1201   ;3187   =0      ERROR1,RC[0D]_LB
U 11B3, 0010,0038,01C0,0918,0010,1395   ;3188           Q_RC[3],CLK.UBCC
U 1395, 0000,013C,0180,0800,0000,11B4   ;3189           Z?
U 11B4, 0019,2000,0580,0998,0000,11AB   ;3190   =0      ALU_Q-K[.1],RC[3]_ALU,J/DARAB1
U 11B5, 0018,0038,6180,0998,0000,11B6   ;3191           RC[3]_K[.F]
U 11B6, 0000,003D,0180,0800,0000,1200   ;3192   =0      ERLOOP
U 11B7, 0810,0038,0180,0918,0082,1396   ;3193   DARAB2: SC_RC[3],D_RC[3]        ; GO BACK AND READ EACH
U 1396, 0001,003C,0180,09E0,0000,1397   ;3194           RC[0C]_D
U 1397, 0001,0028,0180,09F0,0000,1398   ;3195           ALU_NOT.D,RC[0E]_ALU
U 1398, 0000,003C,0180,0868,0000,1399   ;3196           LAB_R(SC)               ; REGISTER. CHECK THE DATA
                                        ;3197                                   ; AND WRITE IT BACK COMPLEMENTED.
U 1399, 001C,2000,0180,0800,0010,139A   ;3198           ALU_LA[A-B]D,CLK.UBCC   ; IS LA CORRECT?
U 139A, 0000,013C,0180,0800,0000,11B8   ;3199           Z?
U 11B8, 0000,003D,0180,09E8,0000,1201   ;3200   =0      ERROR1,RC[0D]_LA
U 11B9, 000D,0000,0180,0800,0010,139B   ;3201           ALU_D[A-B]LB,CLK.UBCC   ; IS LB CORRECT?
U 139B, 0000,013C,0180,0800,0000,11BA   ;3202           Z?
U 11BA, 000C,0039,0180,09E8,0000,1201   ;3203   =0      ERROR1,RC[0D]_LB
U 11BB, 0001,0028,0180,08E8,0000,139C   ;3204           ALU_NOT.D,R(SC)_ALU     ; WRITE COMPLEMENTED DATA.
U 139C, 0010,0038,01C0,0918,0010,139D   ;3205           Q_RC[3],CLK.UBCC
U 139D, 0000,013C,0180,0800,0000,11BC   ;3206           Z?
U 11BC, 0019,2000,0580,0998,0000,11B7   ;3207   =0      ALU_Q-K[.1],RC[3]_ALU,J/DARAB2
U 11BD, 0018,0038,6180,0998,0000,11C0   ;3208           RC[3]_K[.F]
```

```
U 11C0, 0000,003D,0180,0800,0000,1200   ;3209   =0      ERLOOP
U 11C1, 0810,0038,0180,0918,0082,139E   ;3210   DARAB3: SC_RC[3],D_RC[3]         ; READ COMPLEMENTED DATA.
U 139E, 0001,003C,0180,09E0,0000,139F   ;3211           RC[0C]_D
U 139F, 0001,0028,0180,09F0,0000,13A0   ;3212           ALU_NOT.D,RC[0E]_ALU
U 13A0, 0000,003C,0180,0868,0000,13A1   ;3213           LAB_R(SC)
U 13A1, 001C,2010,0180,0800,0010,13A2   ;3214           ALU_LA[A+B+1]D,CLK.UBCC ; IS LA CORRECT?
U 13A2, 0000,013C,0180,0800,0000,11C2   ;3215           Z?
U 11C2, 0000,003D,0180,09E8,0000,1201   ;3216   =0      ERROR1,RC[0D]_LA
U 11C3, 000D,0010,0180,0800,0010,13A3   ;3217           ALU_D[A+B+1]LB,CLK.UBCC ; IS LB CORRECT?
U 13A3, 0000,013C,0180,0800,0000,11C4   ;3218           Z?
U 11C4, 000C,0039,0180,09E8,0000,1201   ;3219   =0      ERROR1,RC[0D]_LB
U 11C5, 0010,0038,01C0,0918,0010,13A4   ;3220           Q_RC[3],CLK.UBCC
U 13A4, 0000,013C,0180,0800,0000,11C6   ;3221           Z?
U 11C6, 0019,2000,0580,0998,0000,11C1   ;3222   =0      ALU_Q-K[.1],RC[3]_ALU,J/DARAB3
U 11C7, 0000,003C,0180,0800,0000,11C8   ;3223           NOP
```

```
                                          ;3224          .PAGE   "TEST 7C        LA_RA[0-7] TEST"
                                          ;3225   ;******************************************************
                                          ;3226   ;++
                                          ;3227   ; TEST  7C      LA_RA[0-7] TEST
                                          ;3228   ;
                                          ;3229   ; TEST DESCRIPTION
                                          ;3230   ;       THIS IS A TEST OF THE LA_RA[] FUNCTION OF THE USPO
                                          ;3231   ;       FIELD.
                                          ;3232   ;
                                          ;3233   ; LOGIC DESCRIPTION
                                          ;3234   ;
                                          ;3235   ; ERROR DESCRIPTION
                                          ;3236   ;       EXPECTED DATA
                                          ;3237   ;       ACTUAL DATA
                                          ;3238   ;       REGISTER ADDRESS
                                          ;3239   ;
                                          ;3240   ;--
                                          ;3241   ;******************************************************
                                          ;3242   =0
U 11C8, 0000,003D,0180,0800,0000,11E9     ;3243   SP1:    NEWTST
U 11C9, 0018,0038,0D80,09F8,0000,13A5     ;3244           RC[0F]_K[.3]
U 13A5, 0818,0038,6180,0800,0000,13A6     ;3245           D_K[.F]
U 13A6, 0001,003C,0180,0800,0082,13A7     ;3246   SP1A:   SC_D                    ; WRITE A FLOATING 1 PATTERN
U 13A7, 0003,001C,0180,08E8,0000,13A8     ;3247           ALU_NOT.MASK,R(SC)_ALU  ; INTO THE RA AND RB REGISTERS
U 13A8, 0001,003C,0180,0800,0010,13A9     ;3248           ALU_D,CLK.UBCC
U 13A9, 0000,013C,0180,0800,0000,11CA     ;3249           Z?
U 11CA, 0819,0000,0580,0800,0000,13A6     ;3250   =0      D_D-K[.1],J/SP1A
U 11CB, 0018,0038,5DC0,0800,0000,11CC     ;3251           Q_K[.7]
U 11CC, 0000,003D,0180,0800,0000,1200     ;3252   =0      ERLOOP
U 11CD, 001B,0000,0580,0AF8,0000,13AA     ;3253   SP1B:   ALU_0-K[.1],R[0F]_ALU   ; PUT FFFFFFFF INTO LB
U 13AA, 0000,003C,0180,0A78,0000,13AB     ;3254           LAB_R[0F]
U 13AB, 0C01,203C,0180,09E0,0082,11D0     ;3255           D_Q,SC_Q,RC[0C]_Q
U 11D0, 0000,193D,0180,0800,0000,1298     ;3256   =0      D3-0?,CALL,J/SPTAB3     ; GO LATCH LA.
U 11D1, 080C,0038,0180,09E8,0000,13AC     ;3257           ALU_LB,D_ALU,RC[0D]_LB  ; SEE IF LB WAS AFFECTED.
U 13AC, 0019,0014,0580,0800,0010,13AD     ;3258           ALU_D+K[.1],CLK.UBCC
U 13AD, 0000,013C,0180,0800,0000,11D2     ;3259           Z?
U 11D2, 001B,0001,0580,09F0,0000,1201     ;3260   =0      ERROR1,RC[0E]_ALU,ALU_0-K[.1] ; LB CLOCKED BY LA_RA[0-7]
U 11D3, 0001,203C,0180,0800,0082,13AE     ;3261           SC_Q
U 13AE, 0000,0038,0180,09F0,0000,13AF     ;3262           ALU_MASK,RC[0E]_ALU
U 13AF, 0800,003C,0180,09E8,0000,13B0     ;3263           D_LA,RC[0D]_LA
U 13B0, 0001,0010,0180,0800,0010,13B1     ;3264           ALU_D[A+B+1]MASK,CLK.UBCC ; IS LA CORRECT?
U 13B1, 0000,013C,0180,0800,0000,11D4     ;3265           Z?
U 11D4, 0000,003D,0180,0800,0000,1201     ;3266   =0      ERROR1
U 11D5, 0001,203C,0180,0800,0010,13B2     ;3267           ALU_Q,CLK.UBCC
U 13B2, 0000,013C,0180,0800,0000,11D6     ;3268           Z?
U 11D6, 0019,2000,05C0,0800,0000,11CD     ;3269   =0      Q_Q-K[.1],J/SP1B
U 11D7, 0818,0038,6180,0800,0000,13B3     ;3270           D_K[.F]
U 13B3, 0001,003C,0180,0800,0082,13B4     ;3271           SC_D
U 13B4, 0003,001C,0180,08E8,0000,13B5     ;3272           ALU_NOT.MASK,R(SC)_ALU
U 13B5, 0001,003C,0180,09E0,0082,13B6     ;3273   SP1C:   SC_D,RC[0C]_D           ; MAKE SURE RA AND RB
U 13B6, 0003,001C,01C0,09F0,0000,13B7     ;3274           ALU_NOT.MASK,Q_ALU,RC[0E]_ALU ; WERE NOT WRITTEN BY LA_RA[0-7]
U 13B7, 0000,003C,0180,0868,0000,13B8     ;3275           ALU_R(SC)
U 13B8, 001C,0000,0180,0800,0010,13B9     ;3276           ALU_LA[A-B]Q,CLK.UBCC   ; LA CORRECT?
U 13B9, 0000,013C,0180,0800,0000,11D8     ;3277           Z?
U 11D8, 0000,003D,0180,09E8,0000,1201     ;3278   =0      ERROR1,RC[0D]_LA
```

```
U 11D9, 000D,2000,0180,0800,0010,13BA   ;3279           ALU_Q[A-B]LB,CLK.UBCC   ; LB CORRECT?
U 13BA, 0000,013C,0180,0800,0000,11DA   ;3280           Z?
U 11DA, 000C,0039,0180,09E8,0000,1201   ;3281   =0      ERROR1,RC[0D]_LB
U 11DB, 0001,003C,0180,0800,0010,13BB   ;3282           ALU_D,CLK.UBCC
U 13BB, 0000,013C,0180,0800,0000,11DC   ;3283           Z?
U 11DC, 0819,0000,0580,0800,0000,13B5   ;3284   =0      D_D-K[.1],J/SP1C
U 11DD, 0000,003C,0180,0800,0000,13BC   ;3285           J7SP1D
                                        ;3286   ; THIS TABLE IS USED TO EXECUTE THE LA_RA[0-7] FUNCTION:
                                        ;3287   =1000
U 1298, 0000,003E,0180,0880,0000,0001   ;3288   SPTAB3: LA_RA[0],RETURN1
U 1299, 0000,003E,0180,0888,0000,0001   ;3289           LA_RA[1],RETURN1
U 129A, 0000,003E,0180,0890,0000,0001   ;3290           LA_RA[2],RETURN1
U 129B, 0000,003E,0180,0898,0000,0001   ;3291           LA_RA[3],RETURN1
U 129C, 0000,003E,0180,08A0,0000,0001   ;3292           LA_RA[4],RETURN1
U 129D, 0000,003E,0180,08A8,0000,0001   ;3293           LA_RA[5],RETURN1
U 129E, 0000,003E,0180,08B0,0000,0001   ;3294           LA_RA[6],RETURN1
U 129F, 0000,003E,0180,08B8,0000,0001   ;3295           LA_RA[7],RETURN1
U 13BC, 0000,003C,0180,0800,0000,11E0   ;3296   SP1D:   NOP
                                        ;3297   =0
U 11E0, 0000,003D,0180,0800,0000,11E9   ;3298   DUMMY1: NEWTST
```

```
;                       Location / Line Number Index

;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000          1871:    1838     1845=    1861=    1862=    1863=    1972=    1973=
U 1008          1975=    1976=    2018=    2019=    2022=    2023=    2690=    2691=
U 1010          1953=    1954=    1955=    1956=    1957=    1958=    1959=    1960=
U 1018          1961=    1962=    1963=    1964=    1965=    1966=    1967=    1968=
U 1020          2001=    2002=    2003=    2004=    2005=    2006=    2007=    2008=
U 1028          2009=    2010=    2011=    2012=    2013=    2014=    2015=    2016=
U 1030          2046=    2047=    2048=    2049=    2050=    2051=    2052=    2053=
U 1038          2054=    2055=    2056=    2057=    2058=    2059=    2060=    2061=
U 1040          2034=    2035=    2120=    2121=    2123=    2124=    1839     2910=
U 1048          2126=    2127=    2131=    2132=    2134=    2135=    1902:    2911=
U 1050          2137=    2138=    2165=    2166=    2169=    2170=    1840     2925=
U 1058          2172=    2173=    1905:    1841     2181=    2182=    1908:    2926=
U 1060          2064=    2065=    2066=    2067=    2068=    2069=    2070=    2071=
U 1068          2072=    2073=    2074=    2075=    2076=    2077=    2078=    2079=
U 1070          2083=    2084=    2085=    2086=    2087=    2088=    2089=    2090=
U 1078          2091=    2092=    2093=    2094=    2095=    2096=    2097=    2098=
U 1080          2101=    2102=    2103=    2104=    2105=    2106=    2107=    2108=
U 1088          2109=    2110=    2111=    2112=    2113=    2114=    2115=    2116=
U 1090          2184=    2185=    2187=    2188=    2215=    2216=    2217=    2218=
U 1098          2220=    2221=    2229=    2230=    2232=    2233=    2694=    2695=
U 10A0          2235=    2236=    2257=    2258=    2262=    2263=    2264=    2265=
U 10A8          2266=    2267=    2276=    2277=    2278=    2279=    2698=    2699=
U 10B0          2287=    2288=    2309=    2310=    2315=    2316=    2334=    2335=
U 10B8          2337=    2338=    2340=    2341=    2344=    2345=    2703=    2704=
U 10C0          2384=    2385=    2389=    2390=    2405=    2406=    2408=    2409=
U 10C8          2411=    2412=    2415=    2416=    2436=    2437=    2707=    2708=
U 10D0          2438=    2439=    2440=    2441=    2457=    2458=    2459=    2460=
U 10D8          2468=    2469=    2475=    2476=    2477=    2478=    2710=    2711=
U 10E0          2486=    2487=    2493=    2494=    2495=    2496=    2503=    2504=
U 10E8          2510=    2511=    2512=    2513=    2520=    2521=    2713=    2714=
U 10F0          2527=    2528=    2529=    2530=    2537=    2538=    2544=    2545=
U 10F8          2546=    2547=    2554=    2555=    2561=    2562=    2716=    2717=
U 1100          1825:    1826:    1827:    1828:    1829:    1830:    1831:    1832:
U 1108          1833:    1842     2563=    2564=    1834:    1835:    1836:    1837:
U 1110          2570=    2571=    2577=    2578=    2579=    2580=    2586=    2587=
U 1118          2593=    2594=    2595=    2596=    2603=    2604=    2731=    2732=
U 1120          2610=    2611=    2612=    2613=    2620=    2621=    2627=    2628=
U 1128          2629=    2630=    2636=    2637=    2643=    2644=    2735=    2736=
U 1130          2645=    2646=    2652=    2653=    2676=    2677=    2685=    2686=
U 1138          2687=    2688=    2725=    2726=    2727=    2728=    2739=    2740=
U 1140          2778=    2779=    2780=    2781=    2814=    2815=    2816=    2817=
U 1148          2855=    2856=    2858=    2859=    2866=    2868=    2743=    2744=
U 1150          2874=    2875=    2877=    2879=    1843     1928:    2897=    2898=
U 1158          2904=    2905=    2906=    2907=    2918=    2919=    2749=    2750=
U 1160          2920=    2921=    2932=    2933=    2934=    2935=    2946=    2947=
U 1168          2948=    2949=    2960=    2961=    2962=    2963=    2754=    2755=
U 1170          2974=    2975=    2976=    2977=    3002=    3003=    3011=    3012=
U 1178          3016=    3017=    3018=    3019=    3027=    3028=    2757=    2758=
U 1180          3032=    3033=    3053=    3054=    3062=    3063=    3067=    3068=
U 1188          3069=    3070=    3078=    3079=    3083=    3084=    2760=    2761=
U 1190          3104=    3105=    3106=    3107=    3109=    3110=    3112=    3113=
U 1198          3120=    3121=    3122=    3123=    3127=    3128=    2764=    2765=
;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 11A0           3136=    3137=    3138=    3139=    3144=    3145=    3152=    3153=
U 11A8           3173=    3174=    3176=    3177=    3181=    3182=    2769=    2770=
U 11B0           3184=    3185=    3187=    3188=    3190=    3191=    3192=    3193=
U 11B8           3200=    3201=    3203=    3204=    3207=    3208=    2783=    2784=
U 11C0           3209=    3210=    3216=    3217=    3219=    3220=    3222=    3223=
U 11C8           3243=    3244=    3250=    3251=    3252=    3253=    2787=    2788=
U 11D0           3256=    3257=    3260=    3261=    3266=    3267=    3269=    3270=
U 11D8           3278=    3279=    3281=    3282=    3284=    3285=    2791=    2792=
U 11E0           3298=    1844     1864     1865     1866     1867     1868     1869
U 11E8           1870     1880     1881     1882     1883     1884     2796=    2797=
U 11F0           1885     1886     1887     1888     1889     1890     1891     1892
U 11F8           1893     1894     1895     1896     1897     1898     2800=    2801=
U 1200           1899     1900     1901     1903     1904     1936     1937     1943
U 1208           1944     1945     1948     1949     1950     1951     2805=    2806=
U 1210           1969     1970     1974     1977     1978     1979     1980     1981
U 1218           1982     1983     1984     1985     1986     1987     2820=    2821=
U 1220           1988     1989     1990     1991     1992     1993     1994     1995
U 1228           1996     2017     2024     2025     2026     2027     2824=    2825=
U 1230           2028     2029     2030     2031     2036     2037     2038     2039
U 1238           2040     2041     2042     2043     2125     2136     2827=    2828=
U 1240           2167     2168     2171     2174     2175     2176     2177     2178
U 1248           2179     2180     2183     2189     2219     2222     2830=    2831=
U 1250           2223     2224     2225     2226     2227     2228     2231     2938=
U 1258           2237     2259     2260     2261     2268     2269     2270     2939=
U 1260           2272     2273     2274     2275     2280     2281     2283     2953=
U 1268           2284     2285     2286     2311     2312     2313     2314     2954=
U 1270           2317     2318     2319     2320     2321     2322     2323     2966=
U 1278           2324     2325     2326     2327     2328     2329     2330     2967=
U 1280           2331     2332     2333     2336     2339     2342     2343     2981=
U 1288           2346     2386     2387     2388     2391     2392     2393     2982=
U 1290           2394     2395     2396     2397     2398     2399     2400     2401
U 1298           3288=    3289=    3290=    3291=    3292=    3293=    3294=    3295=
U 12A0           2402     2403     2404     2407     2410     2413     2414     2417
U 12A8           2442     2443     1929:    2444     2445     2446     2447     2448
U 12B0           2449     2450     2451     2461     2462     2463     2464     2465
U 12B8           2466     2467     2479     2480     2481     2482     2483     2484
U 12C0           2485     2497     2498     2499     2500     2501     2502     2514
U 12C8           2515     2516     2517     2518     2519     2531     2532     2533
U 12D0           2534     2535     2536     2548     2549     2550     2551     2552
U 12D8           2553     2565     2566     2567     2568     2569     2581     2582
U 12E0           2583     2584     2585     2597     2598     2599     2600     2601
U 12E8           2602     2614     2615     2616     2617     2618     2619     2631
U 12F0           2632     2633     2634     2635     2647     2648     2649     2650
U 12F8           2651     2689     2692     2693     2696     2697     2700     2701
U 1300           2702     2705     2706     2709     2712     2715     2729     2730
U 1308           2733     2734     2737     2738     2741     2742     2745     2746
U 1310           2747     2748     2751     2752     2753     2756     2759     2762
U 1318           2763     2766     2767     2768     2782     2785     2786     2789
U 1320           2790     2793     2794     2795     2798     2799     2802     2803
U 1328           2804     2818     2819     2822     2823     2826     2829     2832
U 1330           2857     2860     2861     2862     2863     2864     2865     2869
U 1338           2870     2871     2872     2873     2876     2908     2909     2922
U 1340           2923     2924     2936     2937     2950     2951     2952     2964
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348           2965    2978    2979    2980    3004    3005    3006    3007
U 1350           3008    3009    3010    3013    3014    3015    3020    3021
U 1358           3022    3023    3024    3025    3026    3029    3030    3031
U 1360           3055    3056    3057    3058    3059    3060    3061    3064
U 1368           3065    3066    3071    3072    3073    3074    3075    3076
U 1370           3077    3080    3081    3082    3108    3111    3114    3115
U 1378           3116    3117    3118    3119    3124    3125    3126    3129
U 1380           3130    3131    3132    3133    3134    3135    3140    3142
U 1388           3143    3146    3147    3148    3149    3150    3151    3175
U 1390           3178    3179    3180    3183    3186    3189    3194    3195
U 1398           3196    3198    3199    3202    3205    3206    3211    3212
U 13A0           3213    3214    3215    3218    3221    3245    3246    3247
U 13A8           3248    3249    3254    3255    3258    3259    3262    3263
U 13B0           3264    3265    3268    3271    3272    3273    3274    3275
U 13B8           3276    3277    3280    3283    3296
U 13C0 - 13EF Unused
U 13F0           1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8           1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
          Words not
          in bounds
 ESK00DEF         0
 ESK00MAC         0
 ESKAHMAC         0
  ESKAH24       973

Used            973
Remaining

Total microwords used in memory U: 973
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH24.MIC

Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 1806  MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2002  TEST 7D LAB R[1] AND WRITE RC FUNCTION TEST
; 2081  TEST 7E WRITE R[1] AND LATCH RC FUNCTION TEST
; 2160  TEST 7F LA AND LB CONTROL LOGIC TEST
; 2221  TEST 80 LC CONTROL LOGIC TEST
; 2284  TEST 81 WRITE RA AND RB CONTROL LOGIC TEST
; 2353  TEST 82 WRITE RC CONTROL LOGIC TEST
; 2426  TEST 83 VA, PC AND BMX/PC TEST
; 2467  TEST 84 VA INCREMENT FUNCTION TEST
; 2508  TEST 85 PC INCREMENT BY 1 TEST
; 2549  TEST 86 PC INCREMENT BY 2 TEST
; 2590  TEST 87 PC INCREMENT BY 4 TEST
; 2631  TEST 88 VIBA TEST
; 2671  TEST 89 PCSV REGISTER TEST
; 2717  TEST 8A BEN RLOG STACK EMPTY TEST
; 2782  TEST 8B RLOG STACK TEST
; 3029  TEST 8C BEN EALU.N TEST
; 3071  TEST 8D BEN EALU.Z TEST
; 3112  TEST 8E BEN ALU<01:00> TEST
; 3195  TEST 8F ILLEGAL FLOATING OPERAND UTRAP TEST
```

```
                              ;1      .NOLIST
                              ;1804   .LIST
                              ;1805
```

```
                                       ;1806        .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                       ;1807   .REGION/1000,13FF
                                       ;1808   ;+
                                       ;1809   ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                       ;1810   ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                       ;1811   ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                       ;1812   ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                       ;1813   ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                       ;1814   ;
                                       ;1815   ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                       ;1816   ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                       ;1817   ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                       ;1818   ;       R[OF] AND DO A RETURN0.
                                       ;1819   ;
                                       ;1820   ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                       ;1821   ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                       ;1822   ; TO THE CONSOLE.
                                       ;1823   ;
                                       ;1824   ;-
U 1100, 0000,003C,1980,0800,0084,7003  ;1825   1100:   SC_K[ZERO],J/TRPH1         ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001  ;1826   1101:   SC_K[.1],J/TRPH0           ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001  ;1827   1102:   SC_K[.2],J/TRPH0           ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001  ;1828   1103:   SC_K[.3],J/TRPH0           ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001  ;1829   1104:   SC_K[.4],J/TRPH0           ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001  ;1830   1105:   SC_K[.6],J/TRPH0           ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001  ;1831   1106:   SC_K[.9],J/TRPH0           ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001  ;1832   1107:   SC_K[.7],J/TRPH0           ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001  ;1833   1108:   SC_K[.8],J/TRPH0           ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003  ;1834   110C:   SC_K[.C],J/TRPH1           ; RDS
U 110D, 0000,003C,8980,0800,0084,7003  ;1835   110D:   SC_K[.D],J/TRPH1           ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001  ;1836   110E:   SC_K[.10],J/TRPH0          ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003  ;1837   110F:   SC_K[.F],J/TRPH1           ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,1006  ;1838   TRPH0:  Q_ID[USTACK]
U 1006, 0C00,003C,01E0,0800,0000,100B  ;1839           Q_D,D_Q
U 100B, 0000,003C,8180,3C00,0000,100E  ;1840           ID[USTACK]_D
U 100E, 0C00,003C,01E0,0800,0000,1043  ;1841           Q_D,D_Q
U 1043, 0000,003C,01C0,0A78,0000,1046  ;1842           Q_R[OF]
U 1046, 0001,2024,0180,0800,0010,104B  ;1843           ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 104B, 0000,013C,0180,0800,0000,1002  ;1844           Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000  ;1845   =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
                                       ;1846   ;+
                                       ;1847   ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                       ;1848   ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                       ;1849   ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                       ;1850   ;
                                       ;1851   ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                       ;1852   ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                       ;1853   ;             FAULT STATUS REGISTER
                                       ;1854   ;             SBI ERROR REGISTER
                                       ;1855   ;             TIMEOUT ADDRESS REGISTER
                                       ;1856   ;             MAINTENANCE REGISTER
                                       ;1857   ;             CACHE PARITY REGISTER
                                       ;1858   ;             TB ERROR REGISTER 1
                                       ;1859   ;             TB ERROR REGISTER 0
                                       ;1860   ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,1004    ;1861   TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,71E3    ;1862   =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,1053    ;1863           Q_ID[TBER0]
U 1053, 0001,203C,4DF0,2DB0,0000,1056    ;1864           RC[6]_Q,Q_ID[TBER1]
U 1056, 0001,203C,65F0,2DB8,0000,105B    ;1865           RC[7]_Q,Q_ID[SBI.ERR]
U 105B, 0001,203C,6DF0,2DD8,0000,1076    ;1866           RC[0B]_Q,Q_ID[FAULT]
U 1076, 0001,203C,75F0,2DE0,0000,107E    ;1867           RC[0C]_Q,Q_ID[MAINT]
U 107E, 0001,203C,79F0,2DC8,0000,1089    ;1868           RC[9]_Q,Q_ID[PARITY]
U 1089, 0001,203C,69F0,2DC0,0000,108A    ;1869           RC[8]_Q,Q_ID[TIME.ADDR]
U 108A, 0001,203C,81F0,2DD0,0000,1000    ;1870           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1109    ;1871   1000:   RC[0E]_Q,ERROR1
                                         ;1872   ;+
                                         ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                         ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                         ;1875   ;               NEWTST
                                         ;1876   ;               ERLOOP
                                         ;1877   ;               ERROR1
                                         ;1878   ;               ERROR2
                                         ;1879   ;
U 108E, 0000,003C,65F8,0800,0084,7095    ;1880   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 1095, 0818,0038,8D80,0800,0000,1096    ;1881           D_K[.1F]                        ; ...
U 1096, 0D00,003C,0180,0800,0000,109E    ;1882           D_DAL.SC
U 109E, 0000,003C,3D80,3C00,0000,10AA    ;1883           ID[PSL]_D                       ; WRITE THE PSL
U 10AA, 0818,0038,0580,0800,0000,10AE    ;1884           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 10AE, 0D00,003C,0180,0800,0000,10B6    ;1885           D_DAL.SC
U 10B6, 0F00,003C,3180,3C00,0000,10BE    ;1886           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 10BE, 0000,003C,5D80,3C00,0000,10C6    ;1887           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 10C6, 0000,003C,3980,3C00,0000,10CE    ;1888           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 10CE, 0000,003C,2980,3C00,0000,10D6    ;1889           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 10D6, 0000,003C,4980,3C00,0000,10DE    ;1890           ID[TBER0]_D                     ; SHUT OFF THE TB
U 10DE, 0818,0038,C180,0800,0000,10E2    ;1891           D_K[.FFFF]
U 10E2, 0000,003C,6580,3C00,0000,10E6    ;1892           ID[SBI.ERR]_D
U 10E6, 0F00,003C,6D80,3C00,0000,10EA    ;1893           ID[FAULT]_D,D_0
U 10EA, 0000,003C,6D80,3C00,0000,10EE    ;1894           ID[FAULT]_D
U 10EE, 0000,003C,6580,3C00,0000,10F2    ;1895           ID[SBI.ERR]_D
U 10F2, 0003,003C,0180,09F0,0000,10F6    ;1896           RC[0E]_0
U 10F6, 00C3,003C,0180,0AF8,0000,10FA    ;1897           R[0F]_0
U 10FA, 0003,003C,0180,09E8,0000,105E    ;1898           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 10FE, 0818,0038,0980,0800,0000,105E    ;1899   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 1109, 0810,0038,0180,0978,0000,1112    ;1900   ERROR1: D_RC[0F]
U 1112, 0819,0034,4D80,0800,0000,104E    ;1901           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E    ;1902   104E:   D_D.OR.K[.4],J/CALLCON
U 1116, 0810,0038,0180,0978,0000,111A    ;1903   ERROR2: D_RC[0F]
U 111A, 0819,0034,4D80,0800,0000,105A    ;1904           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E    ;1905   105A:   D_D.OR.K[.6],J/CALLCON
                                         ;1906   105E:
                                         ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E    ;1908           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                         ;1909   ;+
                                         ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                         ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1    ;1912   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2    ;1913   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3    ;1914   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4    ;1915   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,111E   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 111E, 0810,0038,4D80,0978,0000,1154   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 1154, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 11E3, 0010,0038,01C0,0978,0000,11E4   ;1943   SETRCF: Q_RC[OF]
U 11E4, 0019,2034,4DC0,0800,0000,11E5   ;1944           Q_Q.AND.K[.FF00]
U 11E5, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 11E6, 0118,0038,1B80,0800,0000,11EA   ;1947   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 11E7, 0118,0038,0B80,0800,0000,11EA   ;1948   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 11E8, 0118,0038,0780,0800,0000,11EA   ;1949   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 11E9, 0118,0038,C380,0800,0000,11EA   ;1950   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
                                        ;1951   =0000
U 1010, 0018,0038,1980,0800,0000,11E6   ;1952   DC0:    ALU_0(K),J/S00
U 1011, 0018,0038,1980,0800,0000,11E7   ;1953   DC1:    ALU_0(K),J/S01
U 1012, 0018,0038,1980,0800,0000,11E8   ;1954   DC2:    ALU_0(K),J/S10
U 1013, 0018,0038,1980,0800,0000,11E9   ;1955   DC3:    ALU_0(K),J/S11
U 1014, 0018,0038,0980,0800,0000,11E6   ;1956   DC4:    ALU_K[.2],J/S00
U 1015, 0018,0038,0980,0800,0000,11E7   ;1957   DC5:    ALU_K[.2],J/S01
U 1016, 0018,0038,0980,0800,0000,11E8   ;1958   DC6:    ALU_K[.2],J/S10
U 1017, 0018,0038,0980,0800,0000,11E9   ;1959   DC7:    ALU_K[.2],J/S11
U 1018, 0018,0038,0580,0800,0000,11E6   ;1960   DC8:    ALU_K[.1],J/S00
U 1019, 0018,0038,0580,0800,0000,11E7   ;1961   DC9:    ALU_K[.1],J/S01
U 101A, 0018,0038,0580,0800,0000,11E8   ;1962   DCA:    ALU_K[.1],J/S10
U 101B, 0018,0038,0580,0800,0000,11E9   ;1963   DCB:    ALU_K[.1],J/S11
U 101C, 0018,0038,C180,0800,0000,11E6   ;1964   DCC:    ALU_K[.FFFF],J/S00
U 101D, 0018,0038,C180,0800,0000,11E7   ;1965   DCD:    ALU_K[.FFFF],J/S01
U 101E, 0018,0038,C180,0800,0000,11E8   ;1966   DCE:    ALU_K[.FFFF],J/S10
U 101F, 0018,0038,C180,0800,0000,11E9   ;1967   DCF:    ALU_K[.FFFF],J/S11
U 11EA, 0100,003E,0380,0800,0000,0001   ;1968   SX:     D_D.LEFT2,SI/7,RETURN1
U 11EB, 0018,0038,0580,0800,0000,11EC   ;1969   DCAAAA: ALU_K[.1]
U 11EC, 0118,0038,0780,0800,0000,11ED   ;1970           ALU_K[.1],D_D.LEFT2,SI/7
```

```
U 11ED, 0118,0038,0780,0800,0000,11EE   ;1971           ALU_K[.1],D_D.LEFT2,SI/7
U 11EE, 0118,0038,0780,0800,0000,11EF   ;1972           ALU_K[.1],D_D.LEFT2,SI/7
U 11EF, 0118,0038,0780,0800,0000,11F0   ;1973           ALU_K[.1],D_D.LEFT2,SI/7
U 11F0, 0118,0038,0780,0800,0000,11F1   ;1974           ALU_K[.1],D_D.LEFT2,SI/7
U 11F1, 0118,0038,0780,0800,0000,11F2   ;1975           ALU_K[.1],D_D.LEFT2,SI/7
U 11F2, 0118,0038,0780,0800,0000,11F3   ;1976           ALU_K[.1],D_D.LEFT2,SI/7
U 11F3, 0100,003E,0380,0800,0000,0001   ;1977           D_D.LEFT2,SI/7,RETURN1
                                        ;1978   ;
                                        ;1979   ; THIS TABLE IS USED AS A TARGET TO TEST  BRANCHES.
                                        ;1980   ; NOTE THAT IT RETURNS BY RETURN2 IF Q IS
                                        ;1981   ; ZERO AFTER EXECUTION, OR RETURNS BY RETURN1 IF Q IS NON ZERO.
                                        ;1982   =0000
U 1020, 0019,2000,05C0,0800,0000,1021   ;1983   BRTBLE: Q_Q-K[.1]
U 1021, 0019,2000,05C0,0800,0000,1022   ;1984           Q_Q-K[.1]
U 1022, 0019,2000,05C0,0800,0000,1023   ;1985           Q_Q-K[.1]
U 1023, 0019,2000,05C0,0800,0000,1024   ;1986           Q_Q-K[.1]
U 1024, 0019,2000,05C0,0800,0000,1025   ;1987           Q_Q-K[.1]
U 1025, 0019,2000,05C0,0800,0000,1026   ;1988           Q_Q-K[.1]
U 1026, 0019,2000,05C0,0800,0000,1027   ;1989           Q_Q-K[.1]
U 1027, 0019,2000,05C0,0800,0000,1028   ;1990           Q_Q-K[.1]
U 1028, 0019,2000,05C0,0800,0000,1029   ;1991   BRT1:   Q_Q-K[.1]
U 1029, 0019,2000,05C0,0800,0000,102A   ;1992           Q_Q-K[.1]
U 102A, 0019,2000,05C0,0800,0000,102B   ;1993           Q_Q-K[.1]
U 102B, 0019,2000,05C0,0800,0000,102C   ;1994           Q_Q-K[.1]
U 102C, 0019,2000,05C0,0800,0000,102D   ;1995   BRT2:   Q_Q-K[.1]
U 102D, 0019,2000,05C0,0800,0000,102E   ;1996           Q_Q-K[.1]
U 102E, 0019,2000,05C0,0800,0000,102F   ;1997           Q_Q-K[.1]
U 102F, 0001,203C,0180,0800,0010,11F4   ;1998           ALU_Q,CLK.UBCC
U 11F4, 001D,2114,01C0,0800,0000,100C   ;1999           Z?,ALU_Q+D,Q_ALU
U 100C, 0000,003E,0180,0800,0000,0001   ;2000   =0      RETURN1
U 100D, 0000,003E,0180,0800,0000,0002   ;2001           RETURN2
```

```
                                        ;2002           .PAGE   "TEST 7D        LAB_R[1] AND WRITE RC FUNCTION TEST"
                                        ;2003   ;************************************************************
                                        ;2004   ;++
                                        ;2005   ; TEST  7D      LAB_R[1] AND WRITE RC FUNCTION TEST
                                        ;2006   ;
                                        ;2007   ; TEST DESCRIPTION
                                        ;2008   ;       THIS IS A TEST OF THE SPO FIELD FUNCTION WHICH
                                        ;2009   ;       LATCHES RAB[1] AND WRITES RC[].
                                        ;2010   ;
                                        ;2011   ; ERROR DESCRIPTION
                                        ;2012   ;       EXPECTED RC REGISTER DATA
                                        ;2013   ;       GOT RC REGISTER DATA
                                        ;2014   ;       RC REGISTER ADDRESS BEING TESTED
                                        ;2015   ;       EXPECTED LA/LB LATCH CONTENTS
                                        ;2016   ;       GOT LA/LB LATCH CONTENTS
                                        ;2017   ;       ERROR CODE:
                                        ;2018   ;               0=> RC INCORRECT
                                        ;2019   ;               1=> LA/LB INCORRECT
                                        ;2020   ;
                                        ;2021   ;--
                                        ;2022   ;************************************************************
                                        ;2023   =0
U 1044, 0000,003D,0180,0800,0000,108E   ;2024   SP2:    NEWTST
U 1045, 0018,0038,D580,09F8,0000,11F5   ;2025           RC[OF]_K[.6]
U 11F5, 0018,0038,0980,09D8,0000,11F6   ;2026           RC[OB]_K[.2]
U 11F6, 0818,0038,0180,0800,0000,11F7   ;2027           D_K[.8]                 ; SET UP A COUNTER TO WRITE
U 11F7, 0001,003C,0180,0800,0082,11F8   ;2028   SP2A:   SC_D                    ; THE RA/RB REGISTERS
U 11F8, 0003,001C,0180,08E8,0000,11F9   ;2029           ALU_NOT.MASK,R(SC)_ALU  ; 1 IS WRITTEN INTO RA/RB REGISTER 0
U 11F9, 0001,003C,0180,0800,0010,11FA   ;2030           ALU_D,CLK.UBCC          ; 2 IS WRITTEN INTO RA/RB REGISTER 1
U 11FA, 0000,013C,0180,0800,0000,104C   ;2031           Z?                      ; 4 IS WRITTEN INTO RA/RB REGISTER 2
U 104C, 0819,0000,0580,0800,0000,11F7   ;2032   =0      D_D-K[.1],J/SP2A        ; ETC TO 100 IS WRITTEN INTO RA/RB REGISTER 8
U 104D, 0818,0038,0180,0800,0000,11FB   ;2033           D_K[.8]                 ; SET UP A COUTER TO WRITE THE RC REGISTER
U 11FB, 0001,003C,0180,0800,0082,11FC   ;2034   SP2B:   SC_D                    ; 1 IS WRITTEN INTO RC REGISTER 0
U 11FC, 0003,001C,0180,0838,0000,11FD   ;2035           ALU_NOT.MASK,RC(SC)_ALU ; 2 IS WRITTEN INTO RC REGSIETR 1
U 11FD, 0001,003C,0180,0800,0010,11FE   ;2036           ALU_D,CLK.UBCC          ; 4 IS WRITTEN INTO RC REGISTER 3
U 11FE, 0000,013C,0180,0800,0000,1054   ;2037           Z?                      ; 8 IS WRITTEN INTO RC REGISTER 4
U 1054, 0819,0000,0580,0800,0000,11FB   ;2038   =0      D_D-K[.1],J/SP2B        ; ETC TO 100 IS WRITTEN INTO RC REGISTER 8
U 1055, 0018,0038,01C0,0800,0000,1058   ;2039           Q_K[.8]                 ; SET UP A COUNTER FOR THE ACTUAL TEST
U 1058, 0000,003D,0180,0800,0000,10FE   ;2040   =0      ERLOOP
U 1059, 0C01,203C,0180,09E0,0082,105C   ;2041   SP2C:   SC_Q,D_Q,RC[OC]_Q       ; GET READY TO COMPLIMENT THE DATA IN
U 105C, 0000,193D,0180,0A78,0000,1030   ;2042   =0      LAB_R[OF],D3-0?,CALL,J/SPTAB2 ; RC[] AND LATCH LA/LB
U 105D, 0810,0038,0180,0830,0000,11FF   ;2043           ALU_RC(SC),D_ALU        ; GET THE RESULT OF THE TEST FUNCTION
U 11FF, 0001,003C,0180,09E8,0000,1200   ;2044           RC[OD]_D                ; SAVE IT IN CASE OF ERROR
U 1200, 0000,0038,0180,09F0,0000,1201   ;2045           RC[OE]_ALU,ALU_MASK     ; GET THE EXPECTED RESULT.
U 1201, 0000,003C,0180,09D0,0000,1202   ;2046           ALU_LA,RC[OA]_ALU       ; READ THE CONTENTS OF LA
U 1202, 0001,0000,0180,0800,0010,1203   ;2047           ALU_D[A-B]MASK,CLK.UBCC ; SEE IF THE RC REGISTER WAS CORRECT
U 1203, 0003,013C,0180,09C8,0000,1078   ;2048           Z?,RC[9]_0
U 1078, 0000,003D,0180,0800,0000,1109   ;2049   =0      ERROR1                  ; RC[] INCORRECT AFTER TEST FUNCTION
U 1079, 0018,0000,0980,0800,0010,1204   ;2050           ALU_LA-K[.2],CLK.UBCC   ; SEE IF LA WAS CORRECT
U 1204, 0018,0138,0580,09C8,0000,107A   ;2051           Z?,RC[9]_K[.1]
U 107A, 0000,003D,0180,0800,0000,1109   ;2052   =0      ERROR1                  ; LA INCORRECT AFTER TEST INSTRUCTION
U 107B, 080C,0038,0180,09D0,0000,1205   ;2053           ALU_LB,D_ALU,RC[OA]_ALU ; SEE IF LB IS CORRECT
U 1205, 0019,0000,0980,0800,0010,1206   ;2054           ALU_D-K[.2],CLK.UBCC
U 1206, 0000,013C,0180,0800,0000,107C   ;2055           Z?
U 107C, 0000,003D,0180,0800,0000,1109   ;2056   =0      ERROR1                  ; LB INCORRECT AFTER TEST INSTRUCTION
```

```
U 107D, 0001,203C,0180,0800,0010,1207   ;2057            ALU_Q,CLK.UBCC               ; SEE IF THIS TEST HAS BEEN DONE 9 TIMES
U 1207, 0000,013C,0180,0800,0000,108C   ;2058            Z?                           ; ONCE FOR EACH RC REGISTER 0 THRU 8
U 108C, 0019,2000,05C0,0800,0000,1059   ;2059   =0       Q_Q-K[.1],J/SP2C             ; IF NOT DECREMENT COUNTER AND CONTINUE
U 108D, 0000,003C,0180,0800,0000,1208   ;2060            NOP
U 1208, 0000,003C,0180,0800,0000,1209   ;2061            J/SP2F
                                        ;2062   ; THIS TABLE IS USED TO EXECUTE THE TEST INSTRUCTIONS:
                                        ;2063   =0000
U 1030, 0000,003A,0180,0B00,0000,0001   ;2064   SPTAB2:  LAB_R1&RC[0]_ALU,ALU_MASK,RETURN1
U 1031, 0000,003A,0180,0B08,0000,0001   ;2065            LAB_R1&RC[1]_ALU,ALU_MASK,RETURN1
U 1032, 0000,003A,0180,0B10,0000,0001   ;2066            LAB_R1&RC[2]_ALU,ALU_MASK,RETURN1
U 1033, 0000,003A,0180,0B18,0000,0001   ;2067            LAB_R1&RC[3]_ALU,ALU_MASK,RETURN1
U 1034, 0000,003A,0180,0B20,0000,0001   ;2068            LAB_R1&RC[4]_ALU,ALU_MASK,RETURN1
U 1035, 0000,003A,0180,0B28,0000,0001   ;2069            LAB_R1&RC[5]_ALU,ALU_MASK,RETURN1
U 1036, 0000,003A,0180,0B30,0000,0001   ;2070            LAB_R1&RC[6]_ALU,ALU_MASK,RETURN1
U 1037, 0000,003A,0180,0B38,0000,0001   ;2071            LAB_R1&RC[7]_ALU,ALU_MASK,RETURN1
U 1038, 0000,003A,0180,0B40,0000,0001   ;2072            LAB_R1&RC[8]_ALU,ALU_MASK,RETURN1
U 1039, 0000,003A,0180,0B48,0000,0001   ;2073            LAB_R1&RC[9]_ALU,ALU_MASK,RETURN1
U 103A, 0000,003A,0180,0B50,0000,0001   ;2074            LAB_R1&RC[0A]_ALU,ALU_MASK,RETURN1
U 103B, 0000,003A,0180,0B58,0000,0001   ;2075            LAB_R1&RC[0B]_ALU,ALU_MASK,RETURN1
U 103C, 0000,003A,0180,0B60,0000,0001   ;2076            LAB_R1&RC[0C]_ALU,ALU_MASK,RETURN1
U 103D, 0000,003A,0180,0B68,0000,0001   ;2077            LAB_R1&RC[0D]_ALU,ALU_MASK,RETURN1
U 103E, 0000,003A,0180,0B70,0000,0001   ;2078            LAB_R1&RC[0E]_ALU,ALU_MASK,RETURN1
U 103F, 0000,003A,0180,0B78,0000,0001   ;2079            LAB_R1&RC[0F]_ALU,ALU_MASK,RETURN1
U 1209, 0000,003C,0180,0800,0000,1098   ;2080   SP2F:    NOP
```

```
                                             ;2081          .PAGE   "TEST 7E        WRITE R[1] AND LATCH RC FUNCTION TEST"
                                             ;2082   ;*******************************************************
                                             ;2083   ;++
                                             ;2084   ; TEST  7E      WRITE RA AND RB AND LATCH RC FUNCTION TEST
                                             ;2085   ;
                                             ;2086   ; TEST DESCRIPTION
                                             ;2087   ;      THIS IS A TEST OF THE SPO FIELD FUNCTION WHICH
                                             ;2088   ;      LATCHES RC[] AND WRITES RAB[1].
                                             ;2089   ;
                                             ;2090   ; ERROR DESCRIPTION
                                             ;2091   ;      EXPECTED CONTENTS OF RA/RB REGISTER 1
                                             ;2092   ;      GOT CONTENTS OF RA/RB REGISTER 1
                                             ;2093   ;      RC SCRATCH PAD ADDRESS USED
                                             ;2094   ;      EXPECTED CONTENTS OF LC LATCH
                                             ;2095   ;      GOT CONTENTS OF LC LATCH
                                             ;2096   ;      ERROR CODE:
                                             ;2097   ;              0=> LC INCORRECT
                                             ;2098   ;              1=> RA/RB INCORRECT
                                             ;2099   ;
                                             ;2100   ;--
                                             ;2101   ;*******************************************************
                                             ;2102   =0
U 1098, 0000,003D,0180,0800,0000,108E        ;2103   SP3:    NEWTST
U 1099, 0018,0038,D580,09F8,0000,120A        ;2104           RC[OF]_K[.6]
U 120A, 0003,003C,0180,09F0,0000,120B        ;2105           RC[OE]_0
U 120B, 0818,0038,0180,0800,0000,120C        ;2106           D_K[.8]                 ; SET UP A COUNTER TO WRITE THE RA/RB REGISTERS
U 120C, 0001,003C,0180,0800,0082,120D        ;2107   SP3A:   SC_D                    ; 1 IS WRITTEN INTO RA/TB 0
U 120D, 0000,0038,0180,08E8,0000,120E        ;2108           ALU_MASK,R(SC)_ALU      ; 2 IS WRITTEN INTO RA/RB 1
U 120E, 0001,003C,0180,0800,0010,120F        ;2109           ALU_D,CLK.UBCC          ; 4 IS WRITTEN INTO RA/RB 3
U 120F, 0000,013C,0180,0800,0000,109A        ;2110           Z?                      ; 8 IS WRITTEN INTO RA/RB 4
U 109A, 0819,0000,0580,0800,0000,120C        ;2111   =0      D_D-K[.1],J/SP3A        ; ETC TO 100 IS WRITTEN INTO RA/RB 8
U 109B, 0818,0038,0180,0800,0000,1210        ;2112           D_K[.8]                 ; SET UP A COUNTER TO WRITE THE RC REGISTERS
U 1210, 0001,003C,0180,0800,0082,1211        ;2113   SP3B:   SC_D                    ; 1 IS WRITTEN INTO RC REGISTER 0
U 1211, 0000,0038,0180,0838,0000,1212        ;2114           ALU_MASK,RC(SC)_ALU     ; 2 IS WRITTEN INTO RC REGISTER 1
U 1212, 0001,003C,0180,0800,0010,1213        ;2115           ALU_D,CLK.UBCC          ; 4 IS WRITTEN INTO RC REGISTER 2
U 1213, 0000,013C,0180,0800,0000,109C        ;2116           Z?                      ; 8 IS WRITTEN INTO RC REGISTER 3
U 109C, 0819,0000,0580,0800,0000,1210        ;2117   =0      D_D-K[.1],J/SP3B        ; ETC TO 100 IS WRITTEN INTO RC REGISTER 8
U 109D, 0018,0038,01C0,0800,0000,10A8        ;2118           Q_K[.8]                 ; SET UP A COUNTER FOR THE ACTUAL TEST
U 10A8, 0000,003D,0180,0800,0000,10FE        ;2119   =0      ERLOOP
U 10A9, 0C01,203C,0180,0800,0082,1214        ;2120   SP3C:   SC_Q,D_Q                ; GET READY TO LATCH RC[] AND WRITE RA/RB 1
U 1214, 0018,0000,0580,0A88,0000,10AC        ;2121           ALU_0-K[.1],R[1]_ALU    ; INITIALIZE R[1] TO -1
U 10AC, 0000,193D,0180,0A78,0000,1060        ;2122   =0      LAB_R[OF],D3-0?,CALL,J/SPTAB1 ; GO TO THE TABLE FOR THE TEST INSTRUCTION
U 10AD, 0001,203C,0180,09E0,0082,1215        ;2123           SC_Q,RC[OC]_Q
U 1215, 0000,0038,0180,09D8,0000,1216        ;2124           ALU_MASK,RC[OB]_ALU     ; GET THE EXPECTED RESULT
U 1216, 0810,0038,0180,09D0,0000,1217        ;2125           D_LC,RC[OA]_ALU         ; GET THE ACTUAL RESULT FROM LC
U 1217, 0001,0000,0180,0800,0010,1218        ;2126           ALU_D[A-B]MASK,CLK.UBCC ; IS IT CORRECT?
U 1218, 0003,013C,0180,09C8,0000,10B0        ;2127           Z?,RC[9]_0
U 10B0, 0000,003D,0180,0800,0000,1109        ;2128   =0      ERROR1                  ; LC INCORRECT AFTER TEST FUNCTION
U 10B1, 0000,003C,0180,0A08,0000,1219        ;2129           LAB_R[1]                ; CHECK RA/RB 1
U 1219, 000C,0038,0180,09E8,0010,121A        ;2130           ALU_LB,RC[OD]_ALU,CLK.UBCC
U 121A, 0018,0138,0580,09C8,0000,10B2        ;2131           Z?,RC[9]_K[.1]
U 10B2, 0000,003D,0180,0800,0000,1109        ;2132   =0      ERROR1                  ; RB 1 INCORRECT AFTER TEST INSTRUCTION
U 10B3, 0000,003C,0180,09E8,0010,121B        ;2133           ALU_LA,RC[OD]_ALU,CLK.UBCC
U 121B, 0000,013C,0180,0800,0000,10B4        ;2134           Z?
U 10B4, 0000,003D,0180,0800,0000,1109        ;2135   =0      ERROR1                  ; RA 1 INCORRECT AFTER TEST INSTRUCTION
```

```
U 10B5, 0001,203C,0180,0800,0010,121C   ;2136           ALU_Q,CLK.UBCC          ; SEE IF EACH REGISTER ADDRESS
U 121C, 0000,013C,0180,0800,0000,10B8   ;2137           Z?                      ; 0 THRU 8 HAS BEEN TRIED.
U 10B8, 0019,2000,05C0,0800,0000,10A9   ;2138   =0      Q_Q-K[.1],J/SP3C        ; IF NOT CONTINUE
U 10B9, 0000,003C,0180,0800,0000,121D   ;2139           NOP
U 121D, 0000,003C,0180,0800,0000,121E   ;2140           J/SP3F
                                        ;2141   ; THIS TABLE IS USED TO EXECUTE THE TEST INSTRUCTION:
                                        ;2142   =0000
U 1060, 0018,003A,1980,0B80,0000,0001   ;2143   SPTAB1: LC_RC[0]&R1_ALU,ALU_0(K),RETURN1
U 1061, 0018,003A,1980,0B88,0000,0001   ;2144           LC_RC[1]&R1_ALU,ALU_0(K),RETURN1
U 1062, 0018,003A,1980,0B90,0000,0001   ;2145           LC_RC[2]&R1_ALU,ALU_0(K),RETURN1
U 1063, 0018,003A,1980,0B98,0000,0001   ;2146           LC_RC[3]&R1_ALU,ALU_0(K),RETURN1
U 1064, 0018,003A,1980,0BA0,0000,0001   ;2147           LC_RC[4]&R1_ALU,ALU_0(K),RETURN1
U 1065, 0018,003A,1980,0BA8,0000,0001   ;2148           LC_RC[5]&R1_ALU,ALU_0(K),RETURN1
U 1066, 0018,003A,1980,0BB0,0000,0001   ;2149           LC_RC[6]&R1_ALU,ALU_0(K),RETURN1
U 1067, 0018,003A,1980,0BB8,0000,0001   ;2150           LC_RC[7]&R1_ALU,ALU_0(K),RETURN1
U 1068, 0018,003A,1980,0BC0,0000,0001   ;2151           LC_RC[8]&R1_ALU,ALU_0(K),RETURN1
U 1069, 0018,003A,1980,0BC8,0000,0001   ;2152           LC_RC[9]&R1_ALU,ALU_0(K),RETURN1
U 106A, 0018,003A,1980,0BD0,0000,0001   ;2153           LC_RC[0A]&R1_ALU,ALU_0(K),RETURN1
U 106B, 0018,003A,1980,0BD8,0000,0001   ;2154           LC_RC[0B]&R1_ALU,ALU_0(K),RETURN1
U 106C, 0018,003A,1980,0BE0,0000,0001   ;2155           LC_RC[0C]&R1_ALU,ALU_0(K),RETURN1
U 106D, 0018,003A,1980,0BE8,0000,0001   ;2156           LC_RC[0D]&R1_ALU,ALU_0(K),RETURN1
U 106E, 0018,003A,1980,0BF0,0000,0001   ;2157           LC_RC[0E]&R1_ALU,ALU_0(K),RETURN1
U 106F, 0018,003A,1980,0BF8,0000,0001   ;2158           LC_RC[0F]&R1_ALU,ALU_0(K),RETURN1
U 121E, 0000,003C,0180,0800,0000,10BA   ;2159   SP3F:   NOP
```

```
                                              ;2160           .PAGE   "TEST 7F        LA AND LB CONTROL LOGIC TEST"
                                              ;2161   ;**********************************************************
                                              ;2162   ;++
                                              ;2163   ; TEST  7F      LA AND LB CONTROL LOGIC TEST
                                              ;2164   ;
                                              ;2165   ; TEST DESCRIPTION
                                              ;2166   ;       THIS IS A TEST OF THE CONTROL LOGIC FOR THE LA AND LB
                                              ;2167   ;       REGISTER LATCHES. THIS TEST INSURES THAT THESE LATCHES
                                              ;2168   ;       ARE NOT CLOCKED AT TIMES WHEN THEY SHOULD NOT BE
                                              ;2169   ;       CLOCKED.
                                              ;2170   ;
                                              ;2171   ; ERROR DESCRIPTION
                                              ;2172   ;       EXPECTED LA OR LB
                                              ;2173   ;       GOT LA OR LB
                                              ;2174   ;       FUNCTION TRIED (SHOULD NOT HAVE AFFECTED LA OR LB)
                                              ;2175   ;               AS IDENTIFIED BY:
                                              ;2176   ;                       5       SPO/70
                                              ;2177   ;                       4       SPO/30
                                              ;2178   ;                       3       SPO/50
                                              ;2179   ;                       2       SPO/00
                                              ;2180   ;                       1       SPO/18
                                              ;2181   ;                       0       SPO/28
                                              ;2182   ;
                                              ;2183   ;--
                                              ;2184   ;**********************************************************
                                              ;2185   =0
U 10BA, 0000,003D,0180,0800,0000,108E         ;2186   LABT:   NEWTST
U 10BB, 0018,0038,11C0,0800,0000,121F         ;2187           Q_K[.4]
U 121F, 0019,2014,05C0,0800,0000,10BC         ;2188           Q_Q+K[.1]               ; INITIALIZE A COUNTER USED FOR THIS TEST
U 10BC, 0000,003D,0180,0800,0000,10FE         ;2189   =0      ERLOOP
U 10BD, 0003,003C,0180,0A80,0000,1220         ;2190   LABT1:  R[0]_0                  ; INITIALIZE LA AND LB
U 1220, 0000,003C,0180,0A00,0000,1221         ;2191           LAB_R[0]                ; TO 0
U 1221, 0000,003C,6180,0800,0084,7222         ;2192           SC_K[.F]                ; WRITE -1 INTO ALL RA/RB
U 1222, 001B,0000,0580,08E8,0000,1223         ;2193   LABT2:  ALU_0-K[.1],R(SC)_ALU   ; REGISTERS 0 THRU F
U 1223, 0000,0C3C,0180,0800,0000,10E3         ;2194           SC.NE.0?
U 10E3, 0000,003C,0180,0800,0000,1224         ;2195   =011    J/LABT3
U 10E7, 0000,003C,0580,0800,0084,B222         ;2196           SC_SC-K[.1],J/LABT2
U 1224, 0C00,003C,0180,0800,0000,10C0         ;2197   LABT3:  D_Q                     ; GO EXECUTE THE FUNCTION CURRENTLY BEING
U 10C0, 0000,193D,0180,0800,0000,1070         ;2198   =0      D3-0?,CALL,J/RTAB1      ; TESTED, LA/LB SHOULD NOT BE AFFECTED
U 10C1, 0018,0038,0D80,09F8,0000,1225         ;2199           RC[0F]_K[.3]
U 1225, 0000,003C,0180,09E8,0010,1226         ;2200           ALU_LA,RC[0D]_ALU,CLK.UBCC ; SEE IF LA IS CORRECT
U 1226, 0003,013C,0180,09F0,0000,10C2         ;2201           Z?,RC[0E]_0
U 10C2, 0001,203D,0180,09E0,0000,1109         ;2202   =0      ERROR1,RC[0C]_Q         ; LA MODIFIED WHEN IT SHOULD NOT HAVE BEEN
U 10C3, 000C,0038,0180,09E8,0010,1227         ;2203           ALU_LB,RC[0D]_ALU,CLK.UBCC ; SEE IF LB IS CORRECT
U 1227, 0000,013C,0180,0800,0000,10C4         ;2204           Z?
U 10C4, 0001,203D,0180,09E0,0000,1109         ;2205   =0      ERROR1,RC[0C]_Q         ; LB MODIFIED WHEN IT SHOULD NOT HAVE BEEN
U 10C5, 0001,203C,0180,0800,0010,1228         ;2206           ALU_Q,CLK.UBCC          ; TRIED ALL THE TEST FUNCTIONS?
U 1228, 0000,013C,0180,0800,0000,10C8         ;2207           Z?
U 10C8, 0019,2000,05C0,0800,0000,10BD         ;2208   =0      Q_Q-K[.1],J/LABT1       ; IF NOT CONTINUE
U 10C9, 0000,003C,0180,0800,0000,1229         ;2209           J7LABT4
                                              ;2210   ; THIS IS A TABLE OF THE FUNCTIONS TESTED. THESE FUNCTIONS
                                              ;2211   ; SHOULD NOT AFFECT THE CONTENTS OF THE LA AND LB LATCHES:
                                              ;2212   =0000
U 1070, 0000,003E,0180,0940,0000,0001         ;2213   RTAB1:  SPO/28,RETURN1          ; LOAD LC[T8-TF]
U 1071, 0000,003E,0180,08C0,0000,0001         ;2214           SPO/18,RETURN1          ; WRITE RAB[ACN]
```

```
U 1072, 0000,003E,0180,0800,0000,0001   ;2215           SPO/00,RETURN1          ; NOP
U 1073, 0000,003E,0180,0A80,0000,0001   ;2216           SPO/50,RETURN1          ; WRITE RAB[RO-R7]
U 1074, 0000,003E,0180,0980,0000,0001   ;2217           SPO/30,RETURN1          ; WRITE RC[TO-T7]
U 1075, 0000,003E,0180,0B80,0000,0001   ;2218           SPO/70,RETURN1          ; LOAD LC[TO-TF] AND WRITE RAB[R1]
                                        ;2219   =
U 1229, 0000,003C,0180,0800,0000,10CA   ;2220   LABT4:  NOP
```

```
                                                .PAGE   "TEST 80        LC CONTROL LOGIC TEST"
                                        ;*******************************************************
                                        ;++
                                        ; TEST  80      LC CONTROL LOGIC TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF THE LC LATCH CONTROL LOGIC. THIS
                                        ;       TEST INSURES THAT THE LATCH IS NOT CLOCKED WHEN IT
                                        ;       SHOULD NOT BE CLOCKED.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED LC
                                        ;       GOT LC
                                        ;       FUNCTION EXECUTED (SHOULD NOT HAVE AFFECTED LC)
                                        ;               AS IDENTIFIED BY:
                                        ;                               8       SPO/50
                                        ;                               7       SPO/30
                                        ;                               6       SPO/60
                                        ;                               5       SPO/07
                                        ;                               4       SPO/04
                                        ;                               3       SPO/02
                                        ;                               2       SPO/0E
                                        ;                               1       SPO/16
                                        ;                               0       SPO/46
                                        ;
                                        ;--
                                        ;*******************************************************
                                        =0
U 10CA, 0000,003D,0180,0800,0000,108E   LCT:    NEWTST
U 10CB, 0018,0038,01C0,0800,0000,10CC           Q_K[.8]                 ; INITIALIZE A COUNTER
U 10CC, 0000,003D,0180,0800,0000,10FE   =0      ERLOOP
U 10CD, 0003,003C,0180,0980,0000,122A   LCT1:   RC[0]_0                 ; PUT 0 IN THE LC LATCH
U 122A, 0000,003C,0180,0900,0000,122B           LC_RC[0]
U 122B, 0000,003C,6180,0800,0084,722C           SC_K[.F]                ; MAKE THE CONTENTS OF ALL
U 122C, 001B,0000,0580,0838,0000,122D   LCT2:   ALU_0-K[.1],RC(SC)_ALU  ; THE RC REGISTER -1
U 122D, 0000,0C3C,0180,0800,0000,10EB           SC.NE.0?
U 10EB, 0000,003C,0180,0800,0000,122E   =011    J/LCT3
U 10EF, 0000,003C,0580,0800,0084,B22C           SC_SC-K[.1],J/LCT2
U 122E, 0C00,003C,0180,0800,0000,10D0   LCT3:   D_Q                     ; GO EXECUTE THE FUNCTION
U 10D0, 0000,193D,0180,0800,0000,1080   =0      D3-0?,CALL,J/RTAB2      ; WHICH SHOULD NGT AFFECT THE LC LATCH
U 10D1, 0018,0038,0D80,09F8,0000,122F           RC[0F]_K[.3]
U 122F, 0010,0038,0180,09E8,0010,1230           ALU_LC,RC[0D]_ALU,CLK.UBCC ; SEE IF THE LC LATCH WAS AFFECTED
U 1230, 0003,013C,0180,09F0,0000,10D2           Z?,RC[0E]_0
U 10D2, 0001,203D,0180,09E0,0000,1109   =0      ERROR1,RC[0C]_Q         : LC WAS CHANGED BY A FUNCTION
                                                                        ; WHICH SHOULD NOT HAVE HAD ANY AFFECT ON IT
U 10D3, 0001,203C,0180,0800,0010,1231           ALU_Q,CLK.UBCC          ; SEE IF ALL THE FUNCTIONS IN THE
U 1231, 0000,013C,0180,0800,0000,10D4           Z?                      ; TABLE HAVE BEEN TESTED
U 10D4, 0019,2000,05C0,0800,0000,10CD   =0      Q_Q-K[.1],J/LCT1        ; IF NOT CONTINUE
U 10D5, 0000,003C,0180,0800,0000,1232           J7LCT4
                                        ; THIS TABLE CONTAINS REGISTER FUNCTIONS WHICH INSURE THAT
                                        ; LC IS NOT LATCHED AT TIMES WHEN IT SHOULD NOT BE LATCHED:
                                        =0000
U 1080, 0000,003E,0180,0A30,0000,0001   RTAB2:  SPO/46,RETURN1          ; LOAD LAB[R6]
U 1081, 0000,003E,0180,08B0,0000,0001           SPO/16,RETURN1          ; LOAD LA[R6]
U 1082, 0000,003E,0180,0870,0000,0001           SPO/0E,RETURN1          ; LOAD LAB[ACN=6]
```

```
U 1083, 0000,003E,0180,0810,0000,0001   ;2276            SPO/02,RETURN1          ; NOP
U 1084, 0000,003E,0180,0820,0000,0001   ;2277            SPO/04,RETURN1          ; NOP
U 1085, 0000,003E,0180,0838,0000,0001   ;2278            SPO/07,RETURN1          ; WRITE RC[SC]
U 1086, 0000,003E,0180,0B00,0000,0001   ;2279            SPO/60,RETURN1          ; LOAD LAB[R1] AND WRITE RC[T0-TF]
U 1087, 0000,003E,0180,0980,0000,0001   ;2280            SPO/30,RETURN1          ; WRITE RC[T0-TF]
U 1088, 0000,003E,0180,0A80,0000,0001   ;2281            SPO/50,RETURN1          ; WRITE RAB[R0-RF]
                                        ;2282    =
U 1232, 0000,003C,0180,0800,0000,10D8   ;2283    LCT4:   NOP
```

```
                                            ;2284           .PAGE   "TEST 81        WRITE RA AND RB CONTROL LOGIC TEST"
                                            ;2285   ;*******************************************************
                                            ;2286   ;++
                                            ;2287   ; TEST  81      WRITE RA AND RB CONTROL LOGIC TEST
                                            ;2288   ;
                                            ;2289   ; TEST DESCRIPTION
                                            ;2290   ;       THIS IS A TEST OF THE WRITE RA AND RB CONTROL
                                            ;2291   ;       LOGIC THIS TEST INSURES THAT THESE REGISTERS
                                            ;2292   ;       ARE NOT WRITTEN WHEN THEY ARE NOT SUPPOSED
                                            ;2293   ;       TO BE WRITTEN.
                                            ;2294   ;
                                            ;2295   ; ERROR DESCRIPTION
                                            ;2296   ;       EXPECTED DATA
                                            ;2297   ;       ACTUAL DATA
                                            ;2298   ;       REGISTER ADDRESS
                                            ;2299   ;       FUNCTION EXECUTED (SHOULD NOT HAVE AFFECTED RA OR RB)
                                            ;2300   ;               AS GIVEN BY:
                                            ;2301   ;                       4       SP0/60
                                            ;2302   ;                       3       SP0/10
                                            ;2303   ;                       2       SP0/08
                                            ;2304   ;                       1       SP0/38
                                            ;2305   ;                       0       SP0/40
                                            ;2306   ;
                                            ;2307   ;--
                                            ;2308   ;*******************************************************
                                            ;2309   =0
U 10D8, 0000,003D,0180,0800,0000,108E       ;2310   RABT:   NEWTST
U 10D9, 0018,0038,11C0,0800,0000,10DA       ;2311           Q_K[.4]                 ; INITILAIZE A COUNTER
U 10DA, 0000,003D,0180,0800,0000,10FE       ;2312   =0      ERLOOP
U 10DB, 0000,003C,6180,0800,0084,7233       ;2313   RABT2:  SC_K[.F]                ; SET ALL THE RA AND RB REGISTERS
U 1233, 0018,0038,1980,08E8,0000,1234       ;2314   RABT3:  ALU_0(K),R(SC)_ALU      ; TO 0
U 1234, 0000,0C3C,0180,0800,0000,10F3       ;2315           SC.NE.0?
U 10F3, 0000,003C,0180,0800,0000,1235       ;2316   =011    J/RABT4
U 10F7, 0000,003C,0580,0800,0084,B233       ;2317           SC_SC-K[.1],J/RABT3
U 1235, 0C00,003C,0180,0800,0000,10DC       ;2318   RABT4:  D_Q                     ; GO EXECUTE A FUNCTION IN THE TABLE.
U 10DC, 0000,193D,0180,0800,0000,1090       ;2319   =0      D3-0?,CALL,J/RTAB3      ; THIS FUNCTION SHOULD NOT WRITE ANY RA OR RB REGIST
U 10DD, 0000,003C,6180,0800,0084,7236       ;2320           SC_K[.F]                ; SEE IF THE RA AND RB
U 1236, 0000,003C,0180,0868,0000,1237       ;2321   RABT5:  LAB_R(SC)               ; REGISTERS ARE INTACT
U 1237, 0000,003C,0180,09E8,0010,1238       ;2322           ALU_LA,RC[0D]_ALU,CLK.UBCC ; IS RA OK
U 1238, 0018,0038,1180,09F8,0000,1239       ;2323           RC[0F]_K[.4]
U 1239, 0003,003C,0180,09F0,0000,123A       ;2324           RC[0E]_0
U 123A, 0018,0138,1D80,09E0,0000,10E0       ;2325           Z?,ALU_SC,RC[0C]_ALU
U 10E0, 0001,203D,0180,09D8,0000,1109       ;2326   =0      ERROR1,RC[0B]_Q         ; RA REGISTER CONTENTS WAS CHANGED BY
                                            ;2327                                   : A FUNCTION WHICH SHOULD HAVE NOT CHANGE
                                            ;2328                                   ; ANY RA REGISTER
U 10E1, 000C,0038,0180,09E8,0010,123B       ;2329           ALU_LB,RC[0D]_ALU,CLK.UBCC ; CHECK THE RB REGISTERS
U 123B, 0000,013C,0180,0800,0000,10E4       ;2330           Z?
U 10E4, 0001,203D,0180,09D8,0000,1109       ;2331   =0      ERROR1,RC[0B]_Q         ; AN RB REGISTER WAS CHANGED BY A
                                            ;2332                                   ; FUNCTION WHICH SHOULD HAVE
                                            ;2333                                   ; HAD NO AFFECT ON THE RB REGISTERS.
U 10E5, 0000,0C3C,0180,0800,0000,10FB       ;2334           SC.NE.0?                ; SEE IF ALL REGISTERS HAVE BEEN CHECKED
U 10FB, 0000,003C,0180,0800,0000,123C       ;2335   =011    J/RABT6
U 10FF, 0000,003C,0580,0800,0084,B236       ;2336           SC_SC-K[.1],J/RABT5     ; IF NOT CONTINUE
U 123C, 0001,203C,0180,0800,0010,123D       ;2337   RABT6:  ALU_Q,CLK.UBCC          ; SEE IF ALL THE TEST FUNCTIONS
U 123D, 0000,013C,0180,0800,0000,10E8       ;2338           Z?                      ; HAVE BEEN TRIED
```

```
U 10E8, 0019,2000,05C0,0800,0000,10DB    ;2339   =0      Q_Q-K[.1],J/RABT2          ; IF NOT CONTINUE
U 10E9, 0000,003C,0180,0800,0000,123E    ;2340           J7RABT7
                                         ;2341   ; THIS IS A TABLE OF FUNCTIONS WHICH SHOULD NOT WRITE INTO ANY
                                         ;2342   ; OF THE RA OR RB REGISTERS. TESTING THESE FUNCTIONS WILL INSURE
                                         ;2343   ; THAT THE RA AND RB REGISTERS ARE NOT WRITTEN WHEN THEY SHOULD
                                         ;2344   ; NOT BE WRITTEN:
                                         ;2345   =0000
U 1090, 001B,0002,0580,0A00,0000,0001    ;2346   RTAB3:  ALU_0-K[.1],SPO/40,RETURN1      ; LOAD LAB[R0-RF]
U 1091, 001B,0002,0580,09C0,0000,0001    ;2347           ALU_0-K[.1],SPO/38,RETURN1      ; WRITE RC[T8-TF
U 1092, 001B,0002,0580,0840,0000,0001    ;2348           ALU_0-K[.1],SPO/08,RETURN1      ; LOAD LAB[ACN]
U 1093, 001B,0002,0580,0880,0000,0001    ;2349           ALU_0-K[.1],SPO/10,RETURN1      ; LOAD LA[R0-R7]
U 1094, 001B,0002,0580,0B00,0000,0001    ;2350           ALU_0-K[.1],SPO/60,RETURN1      ; LOAD LAB[R1] AND WRITE RC[T0-TF]
                                         ;2351   =
U 123E, 0000,003C,0180,0800,0000,10EC    ;2352   RABT7:  NOP
```

```
                                             ;2353          .PAGE   "TEST 82        WRITE RC CONTROL LOGIC TEST"
                                             ;2354   ;**********************************************************
                                             ;2355   ;++
                                             ;2356   ; TEST  82      WRITE RC CONTROL LOGIC TEST
                                             ;2357   ;
                                             ;2358   ; TEST DESCRIPTION
                                             ;2359   ;      THIS IS A TEST OF THE WRITE RC CONTROL LOGIC. THIS
                                             ;2360   ;      TEST INSURES THAT THE RC SCRATCH PADS ARE NOT WRITTEN WHEN
                                             ;2361   ;      THEY ARE NOT SUPPOSED TO BE WRITTEN.
                                             ;2362   ;
                                             ;2363   ; ERROR DESCRIPTION
                                             ;2364   ;      EXPECTED DATA
                                             ;2365   ;      ACTUAL DATA
                                             ;2366   ;      REGISTER ADDRESS
                                             ;2367   ;      FUNCTION EXECUTED (SHOULD NOT HAVE AFFECTED RC)
                                             ;2368   ;              AS GIVEN BY:
                                             ;2369   ;                      7       SP0/70
                                             ;2370   ;                      6       SP0/06
                                             ;2371   ;                      5       SP0/05
                                             ;2372   ;                      4       SP0/03
                                             ;2373   ;                      3       SP0/0F
                                             ;2374   ;                      2       SP0/17
                                             ;2375   ;                      1       SP0/27
                                             ;2376   ;                      0       SP0/47
                                             ;2377   ;
                                             ;2378   ;--
                                             ;2379   ;**********************************************************
                                             ;2380   =0
U 10EC, 0000,003D,0180,0800,0000,108E        ;2381   RCT:    NEWTST
U 10ED, 0018,0038,5DC0,0800,0000,10F0        ;2382           Q_K[.7]                 ; SET UP A COUNTER USED FOR THIS TEST
U 10F0, 0000,003D,0180,0800,0000,10FE        ;2383   =0      ERLOOP
U 10F1, 0000,003C,6180,0800,0084,723F        ;2384   RCT1:   SC_K[.F]                ; WRITE 0 INTO ALL THE RC REGISTERS
U 123F, 0018,0038,1980,0838,0000,1240        ;2385   RCT2:   ALU_0(K),RC(SC)_ALU
U 1240, 0000,0C3C,0180,0800,0000,1113        ;2386           SC.NE.0?
U 1113, 0000,003C,0180,0800,0000,1241        ;2387   =011    J/RCT3
U 1117, 0000,003C,0580,0800,0084,B23F        ;2388           SC_SC-K[.1],J/RCT2
U 1241, 0C00,003C,0180,0800,0000,10F4        ;2389   RCT3:   D_Q                     ; GO EXECUTE THE TEST INSTRUCTION
U 10F4, 0000,193D,0180,0800,0000,10A0        ;2390   =0      D3-0?,CALL,J/RTAB4      ; WHICH SHOULD NOT WRITE INTO RC
U 10F5, 0000,003C,6180,0800,0084,7242        ;2391           SC_K[.F]                ; READ BACK ALL THE RC REGISTERS
U 1242, 0000,003C,0180,0830,0000,1243        ;2392   RCT4:   LC_RC(SC)               ; TO INSURE NONE WERE MODIFIED
U 1243, 0810,0038,0180,0800,0010,1244        ;2393           D_[C,CLK.UBCC
U 1244, 0000,013C,0180,0800,0000,10F8        ;2394           Z?
U 10F8, 0000,003C,0180,0800,0000,1245        ;2395   =0      J/RCT45
U 10F9, 0000,003C,0180,0800,0000,10FD        ;2396           J/RCT46
U 1245, 0001,003C,0180,09E8,0000,1246        ;2397   RCT45:  RC[0D]_D                ; SAVE DATA FOR ERROR PRINT OUT
U 1246, 0003,003C,0180,09F0,0000,1247        ;2398           RC[0E]_0
U 1247, 0018,0038,1180,09F8,0000,1248        ;2399           RC[0F]_K[.4]
U 1248, 0018,0038,1D80,09E0,0000,10FC        ;2400           ALU_SC,RC[0C]_ALU
U 10FC, 0001,203D,0180,09D8,0000,1109        ;2401   =0      RC[0B]_Q,ERROR1         ; AN RC REGISTER WAS WRITTEN BY
                                             ;2402                                   ; A REGISTER FUNTION WHICH SHOULD NOT
                                             ;2403                                   ; HAVE DONE A WRITE TO RC
U 10FD, 0000,0C3C,0180,0800,0000,111B        ;2404   RCT46:  SC.NE.0?                ; CHECKED ALL REGISTERS?
U 111B, 0000,003C,0180,0800,0000,1249        ;2405   =011    J/RCT5
U 111F, 0000,003C,0580,0800,0084,B242        ;2406           SC_SC-K[.1],J/RCT4      ; IF NOT READ NEXT RC REGISTER
U 1249, 0001,203C,0180,0800,0010,124A        ;2407   RCT5:   ALU_Q,CLK.UBCC          ; TRIED ALL TEST FUNCTIONS
```

```
U 124A, 0000,013C,0180,0800,0000,110A   ;2408           Z?
U 110A, 0019,2000,05C0,0800,0000,10F1   ;2409   =0      Q_Q-K[.1],J/RCT1          ; IF NOT CONTINUE
U 110B, 0000,003C,0180,0800,0000,124B   ;2410           J7RCT6
                                        ;2411   ; THIS IS A TABLE OF FUNCTIONS WHICH SHOULD NOT WRITE ANY OF THE RC
                                        ;2412   ; REGISTERS. PROPER EXECUTION OF THESE FUNCTIONS WILL INSURE THAT THE
                                        ;2413   ; RC REGISTERS ARE NOT WRITTEN BY FUNCTIONS WHICH SHOULD NOT WRITE THESE
                                        ;2414   ; REGISTERS:
                                        ;2415   =0000
U 10A0, 001B,0002,0580,0A38,0000,0001   ;2416   RTAB4:  ALU_0-K[.1],SPO/47,RETURN1      ; LOAD LAB[R7]
U 10A1, 001B,0002,0580,0938,0000,0001   ;2417           ALU_0-K[.1],SPO/27,RETURN1      ; LOAD LC[T7]
U 10A2, 001B,0002,0580,08B8,0000,0001   ;2418           ALU_0-K[.1],SPO/17,RETURN1      ; LOAD LA[R7]
U 10A3, 001B,0002,0580,0878,0000,0001   ;2419           ALU_0-K[.1],SPO/0F,RETURN1      ; LOAD LAB[ACN=7]
U 10A4, 001B,0002,0580,0818,0000,0001   ;2420           ALU_0-K[.1],SPO/03,RETURN1      ; NOP
U 10A5, 001B,0002,0580,0828,0000,0001   ;2421           ALU_0-K[.1],SPO/05,RETURN1      ; NOP
U 10A6, 001B,0002,0580,0830,0000,0001   ;2422           ALU_0-K[.1],SPO/06,RETURN1      ; LOAD RC[SC]
U 10A7, 001B,0002,0580,0B80,0000,0001   ;2423           ALU_0-K[.1],SPO/70,RETURN1      ; LOAD LC[T0-TF] AND WRITE RAB[R1]
                                        ;2424   =
U 124B, 0000,003C,0180,0800,0000,1110   ;2425   RCT6:   NOP
```

```
                                            .PAGE   "TEST 83        VA, PC AND BMX/PC TEST"
                                    ;*******************************************************
                                    ;++
                                    ; TEST  83      VA, PC AND BMX/PC TEST
                                    ;
                                    ; TEST DESCRIPTION
                                    ;       THIS IS TEST OF THE VA REGISTER LOAD FUNCTION, THE PC
                                    ;       LOAD FUNCTION AND THE BMX PC INPUTS.
                                    ;
                                    ; ERROR DESCRIPTION
                                    ;       EXPECTED DATA
                                    ;       ACTUAL DATA
                                    ;
                                    ;--
                                    ;*********************************************      ***
                                    =0
U 1110, 0000,003D,0180,0800,0000,108E  VAPC1:  NEWTST
U 1111, 0018,0038,0980,09F8,0000,124C          RC[OF]_K[.2]
U 124C, 0018,0038,8D80,0A98,0000,1114          R[3]_K[.1F]
U 1114, 0000,003D,0180,0800,0000,10FE  =0      ERLOOP
U 1115, 0000,003C,0180,0A18,0082,124D  VAPC1A: SC_R[3]
U 124D, 0000,0038,01C0,09F0,0200,124E          ALU_MASK,VA_ALU,Q_ALU,RC[OE]_ALU ; LOAD VA
U 124E, 0018,0038,1980,0800,0000,124F          ALU_0(K)                  ; CHANGE INPUT DATA TO VA.
U 124F, 0000,003C,0180,0801,0000,1250          PCK7PC_VA                 ; LOAD PC
U 1250, 0018,0038,1980,0800,0200,1251          ALU_0(K),VA_ALU           ; CHANGE INPUT DATA TO PC
U 1251, 0814,0038,0180,09E8,0000,1252          BMX7PC,ALU/B,D_ALU,RC[OD]_ALU ; READ PC THROUGH BMX
U 1252, 001D,2000,0180,0800,0010,1253          ALU_Q-D,CLK.UBCC          ; IS IT CORRECT?
U 1253, 0000,013C,0180,0800,0000,1118          Z?
U 1118, 0000,003D,0180,0800,0000,1109  =0      ERROR1
U 1119, 0003,001C,01C0,09F0,0200,1254          ALU_NOT.MASK,VA_ALU,Q_ALU,RC[OE]_ALU ; LOAD VA
U 1254, 001B,0000,0580,0800,0000,1255          ALU_0-K[.1]               ; CHANGE INPUT DATA TO VA
U 1255, 0000,003C,0180,0801,0000,1256          PCK7PC_VA                 ; LOAD PC
U 1256, 001B,0000,0580,0800,0200,1257          ALU_0-K[.1],VA_ALU        ; CHANGE INPUT DATA TO PC
U 1257, 0814,0038,0180,09E8,0000,1258          BMX7PC,ALU/B,D_ALU,RC[OD]_ALU ; READ PC THROUGH BMX
U 1258, 001D,2000,0180,0800,0010,1259          ALU_Q-D,CLK.UBCC          ; IS IT CORRECT?
U 1259, 0000,013C,0180,0800,0000,111C          Z?
U 111C, 0000,003D,0180,0800,0000,1109  =0      ERROR1
U 111D, 0000,003C,0180,0A18,0010,125A          ALU_R[3],CLK.UBCC
U 125A, 0000,013C,0180,0800,0000,1120          Z?
U 1120, 0018,0000,0580,0A98,0000,1115  =0      R[3]_LA-K[.1],J/VAPC1A
U 1121, 0000,003C,0180,0800,0000,1122          NOP
```

```
                                        ;2467          .PAGE   "TEST 84        VA INCREMENT FUNCTION TEST"
                                        ;2468   ;**********************************************************
                                        ;2469   ;++
                                        ;2470   ; TEST  84      VA INCREMENT FUNCTION TEST
                                        ;2471   ;
                                        ;2472   ; TEST DESCRIPTION
                                        ;2473   ;      THIS IS TEST OF THE VA REGISTER INCREMENT FUNCTION, THE PC
                                        ;2474   ;      LOAD FUNCTION AND THE BMX PC INPUTS.
                                        ;2475   ;
                                        ;2476   ; ERROR DESCRIPTION
                                        ;2477   ;      EXPECTED RESULT
                                        ;2478   ;      ACTUAL RESULT
                                        ;2479   ;
                                        ;2480   ;--
                                        ;2481   ;**********************************************************
                                        ;2482   =0
U 1122, 0000,003D,0180,0800,0000,108E   ;2483   VAPC2:  NEWTST
U 1123, 0018,0038,0980,09F8,0000,125B   ;2484           RC[0F]_K[.2]
U 125B, 0018,0038,8D80,0A98,0000,1124   ;2485           R[3]_K[.1F]
U 1124, 0000,003D,0180,0800,0000,10FE   ;2486   =0      ERLOOP
U 1125, 0000,003C,0180,0A18,0082,125C   ;2487   VAPC2A: SC_R[3]
U 125C, 0000,0038,01C0,0800,0200,125D   ;2488           ALU_MASK,VA_ALU,Q_ALU   ; LOAD TEST PATTERN INTO VA
U 125D, 0000,003C,0180,0803,0000,125E   ;2489           PCK/VA+4                ; INCREMENT VA BY 4.
U 125E, 0000,003C,0180,0801,0000,125F   ;2490           PCK/PC_VA               ; LOAD VA INTO PC
U 125F, 0814,0038,0180,09E8,0000,1260   ;2491           BMX/PC_ALU/B,D_ALU,RC[0D]_ALU ; READ PC THROUGH BMX
U 1260, 0019,2014,11C0,09F0,0000,1261   ;2492           ALU_Q+K[.4],Q_ALU,RC[0E]_ALU ; COMPUTE EXPECTED RESULT
U 1261, 001D,2000,0180,0800,0010,1262   ;2493           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 1262, 0000,013C,0180,0800,0000,1126   ;2494           Z?
U 1126, 0000,003D,0180,0800,0000,1109   ;2495   =0      ERROR1
U 1127, 0003,001C,01C0,0800,0200,1263   ;2496           ALU_NOT.MASK,VA_ALU,Q_ALU ; LOAD VA
U 1263, 0000,003C,0180,0803,0000,1264   ;2497           PCK/VA+4                ; INCREMENT VA BY 4
U 1264, 0000,003C,0180,0801,0000,1265   ;2498           PCK/PC_VA               ; LOAD VA INTO PC
U 1265, 0814,0038,0180,09E8,0000,1266   ;2499           BMX/PC_ALU/B,D_ALU,RC[0D]_ALU ; READ PC THROUGH BMX
U 1266, 0019,2014,11C0,09F0,0000,1267   ;2500           ALU_Q+K[.4],Q_ALU,RC[0E]_ALU ; COMPUTE EXPECTED RESULT
U 1267, 001D,2000,0180,0800,0010,1268   ;2501           ALU_Q-D,CLK.UBCC        ; IS IT CORRECT?
U 1268, 0000,013C,0180,0800,0000,1128   ;2502           Z?
U 1128, 0000,003D,0180,0800,0000,1109   ;2503   =0      ERROR1
U 1129, 0000,003C,0180,0A18,0010,1269   ;2504           ALU_R[3],CLK.UBCC
U 1269, 0000,013C,0180,0800,0000,112A   ;2505           Z?
U 112A, 0018,0000,0580,0A98,0000,1125   ;2506   =0      R[3]_LA-K[.1],J/VAPC2A
U 112B, 0000,003C,0180,0800,0000,112C   ;2507           NOP
```

```
                                              .PAGE   "TEST 85        PC INCREMENT BY 1 TEST"
                                        ;*******************************************************
                                        ;++
                                        ; TEST  85      INCREMENT PC BY 1 TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS TEST OF THE VA REGISTER LOAD FUNCTION, THE PC
                                        ;       INCREMENT BY 1 FUNCTION AND THE BMX PC INPUTS.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED RESULT
                                        ;       ACTUAL RESULT
                                        ;
                                        ;--
                                        ;*******************************************************
                                        =0
U 112C, 0000,003D,0180,0800,0000,108E   VAPC3:  NEWTST
U 112D, 0018,0038,0980,09F8,0000,126A           RC[0F]_K[.2]
U 126A, 0018,0038,8D80,0A98,0000,112E           R[3]_K[.1F]
U 112E, 0000,003D,0180,0800,0000,10FE   =0      ERLOOP
U 112F, 0000,003C,0180,0A18,0082,126B   VAPC3A: SC_R[3]
U 126B, 0000,0038,01C0,0800,0200,126C           ALU_MASK,VA_ALU,Q_ALU   ; LOAD VA
U 126C, 0000,003C,0180,0801,0000,126D           PCK/PC_VA               ; LOAD VA INTO PC
U 126D, 0000,003C,0180,0804,0000,126E           PCK/PC+1                ; INCREMENT PC BY 1
U 126E, 0814,0038,0180,09E8,0000,126F           BMX/PC,ALU/B,D_ALU,RC[0D]_ALU ; READ PC THROUGH BMX
U 126F, 0019,2014,05C0,09F0,0000,1270           ALU_Q+K[.1],Q_ALU,RC[0E]_ALU ; COMPUTE EXPECTED RESULT
U 1270, 001D,2000,0180,0800,0010,1271           ALU_Q-D,CLK.UBCC        ; ACTUAL RESULT CORRECT?
U 1271, 0000,013C,0180,0800,0000,1130           Z?
U 1130, 0000,003D,0180,0800,0000,1109   =0      ERROR1
U 1131, 0003,001C,01C0,0800,0200,1272           ALU_NOT.MASK,VA_ALU,Q_ALU ; LOAD VA
U 1272, 0000,003C,0180,0801,0000,1273           PCK/PC_VA               ; LOAD VA INTO PC
U 1273, 0000,003C,0180,0804,0000,1274           PCK/PC+1                ; INCREMENT THE PC BY 1
U 1274, 0814,0038,0180,09E8,0000,1275           BMX/PC,ALU/B,D_ALU,RC[0D]_ALU ; READ THE PC THROUGH THE BMX
U 1275, 0019,2014,05C0,09F0,0000,1276           ALU_Q+K[.1],Q_ALU,RC[0E]_ALU ; COMPUTE THE EXPECTED RESULT
U 1276, 001D,2000,0180,0800,0010,1277           ALU_Q-D,CLK.UBCC        ; WAS THE ACTUAL RESULT CORRECT?
U 1277, 0000,013C,0180,0800,0000,1132           Z?
U 1132, 0000,003D,0180,0800,0000,1109   =0      ERROR1
U 1133, 0000,003C,0180,0A18,0010,1278           ALU_R[3],CLK.UBCC
U 1278, 0000,013C,0180,0800,0000,1134           Z?
U 1134, 0018,0000,0580,0A98,0000,112F   =0      R[3]_LA-K[.1],J/VAPC3A
U 1135, 0000,003C,0180,0800,0000,1136           NOP
```

```
                                        ;2549           .PAGE   "TEST 86        PC INCREMENT BY 2 TEST"
                                        ;2550   ;**********************************************************
                                        ;2551   ;++
                                        ;2552   ; TEST  86      PC INCREMENT BY 2 TEST
                                        ;2553   ;
                                        ;2554   ; TEST DESCRIPTION
                                        ;2555   ;       THIS IS TEST OF THE VA REGISTER LOAD FUNCTION, THE PC
                                        ;2556   ;       INCREMENT BY 2 FUNCTION AND THE BMX PC INPUTS.
                                        ;2557   ;
                                        ;2558   ; ERROR DESCRIPTION
                                        ;2559   ;       EXPECTED RESULT
                                        ;2560   ;       ACTUAL RESULT
                                        ;2561   ;
                                        ;2562   ;--
                                        ;2563   ;**********************************************************
                                        ;2564   =0
U 1136, 0000,003D,0180,0800,0000,108E   ;2565   VAPC4:  NEWTST
U 1137, 0018,0038,0980,09F8,0000,1279   ;2566           RC[OF]_K[.2]
U 1279, 0018,0038,8D80,0A98,0000,1138   ;2567           R[3]_K[.1F]
U 1138, 0000,003D,0180,0800,0000,10FE   ;2568   =0      ERLOOP
U 1139, 0000,003C,0180,0A18,0082,127A   ;2569   VAPC4A: SC_R[3]
U 127A, 0000,0038,01C0,0800,0200,127B   ;2570           ALU_MASK,VA_ALU,Q_ALU   ; LOAD THE VA
U 127B, 0000,003C,0180,0801,0000,127C   ;2571           PCK/PC_VA               ; LOAD THE VA INTO THE PC
U 127C, 0000,003C,0180,0805,0000,127D   ;2572           PCK/PC+2                ; INCREMENT THE PC BY 2
U 127D, 0814,0038,0180,09E8,0000,127E   ;2573           BMX/PC,ALU/B,D_ALU,RC[OD]_ALU ; READ THE PC THROUGH THE BMX
U 127E, 0019,2014,09C0,09F0,0000,127F   ;2574           ALU_Q+K[.2],Q_ALU,RC[OE]_ALU ; COMPUTE THE EXPECTED RESULT
U 127F, 001D,2000,0180,0800,0010,1280   ;2575           ALU_Q-D,CLK.UBCC        ; WAS THE ACTUAL RESULT CORRECT?
U 1280, 0000,013C,0180,0800,0000,113A   ;2576           Z?
U 113A, 0000,003D,0180,0800,0000,1109   ;2577   =0      ERROR1
U 113B, 0003,001C,01C0,0800,0200,1281   ;2578           ALU_NOT.MASK,VA_ALU,Q_ALU ; LOAD THE VA
U 1281, 0000,003C,0180,0801,0000,1282   ;2579           PCK/PC_VA               ; LOAD THE VA INTO THE PC
U 1282, 0000,003C,0180,0805,0000,1283   ;2580           PCK/PC+2                ; INCREMENT THE PC BY 2
U 1283, 0814,0038,0180,09E8,0000,1284   ;2581           BMX/PC,ALU/B,D_ALU,RC[OD]_ALU ; READ THE PC THROUGH THE BMX
U 1284, 0019,2014,09C0,09F0,0000,1285   ;2582           ALU_Q+K[.2],Q_ALU,RC[OE]_ALU ; COMPUTE THE EXPECTED RESULT
U 1285, 001D,2000,0180,0800,0010,1286   ;2583           ALU_Q-D,CLK.UBCC        ; WAS THE ACTUAL RESULT CORRECT?
U 1286, 0000,013C,0180,0800,0000,113C   ;2584           Z?
U 113C, 0000,003D,0180,0800,0000,1109   ;2585   =0      ERROR1
U 113D, 0000,003C,0180,0A18,0010,1287   ;2586           ALU_R[3],CLK.UBCC
U 1287, 0000,013C,0180,0800,0000,113E   ;2587           Z?
U 113E, 0018,0000,0580,0A98,0000,1139   ;2588   =0      R[3]_LA-K[.1],J/VAPC4A
U 113F, 0000,003C,0180,0800,0000,1140   ;2589           NOP
```

```
                                                   .PAGE   "TEST 87        PC INCREMENT BY 4 TEST"
                                           ;*********************************************************
                                           ;++
                                           ; TEST  87      INCREMENT PC BY 4 TEST
                                           ;
                                           ; TEST DESCRIPTION
                                           ;       THIS IS TEST OF THE VA REGISTER LOAD FUNCTION, THE PC
                                           ;       INCREMENT BY 4 FUNCTION AND THE BMX PC INPUTS.
                                           ;
                                           ; ERROR DESCRIPTION
                                           ;       EXPECTED RESULT
                                           ;       ACTUAL RESULT
                                           ;
                                           ;--
                                           ;*********************************************************
                                           =0
U 1140, 0000,003D,0180,0800,0000,108E      VAPC5:  NEWTST
U 1141, 0018,0038,0980,09F8,0000,1288              RC[OF]_K[.2]
U 1288, 0018,0038,8D80,0A98,0000,1142              R[3]_K[.1F]
U 1142, 0000,003D,0180,0800,0000,10FE      =0      ERLOOP
U 1143, 0000,003C,0180,0A18,0082,1289      VAPC5A: SC_R[3]
U 1289, 0000,0038,01C0,0800,0200,128A              ALU_MASK,VA_ALU,Q_ALU    ; LOAD THE VA
U 128A, 0000,003C,0180,0801,0000,128B              PCK7PC_VA                ; LOAD THE VA INTO THE PC
U 128B, 0000,003C,0180,0806,0000,128C              PCK/PC+4                 ; INCREMENT THE PC BY 4
U 128C, 0814,0038,0180,09E8,0000,128D              BMX/PC,ALU/B,D_ALU,RC[OD]_ALU ; READ THE PC THROUGH THE BMX
U 128D, 0019,2014,11C0,09F0,0000,128E              ALU_Q+K[.4],Q_ALU,RC[OE]_ALU ; COMPUTE THE EXPECTED RESULT
U 128E, 001D,2000,0180,0800,0010,128F              ALU_Q-D,CLK.UBCC         ; WAS THE ACTUAL RESULT CORRECT?
U 128F, 0000,013C,0180,0800,0000,1144              Z?
U 1144, 0000,003D,0180,0800,0000,1109      =0      ERROR1
U 1145, 0003,001C,01C0,0800,0200,1290              ALU_NOT.MASK,VA_ALU,Q_ALU ; LOAD THE VA
U 1290, 0000,003C,0180,0801,0000,1291              PCK7PC_VA                ; LOAD THE VA INTO THE PC
U 1291, 0000,003C,0180,0806,0000,1292              PCK/PC+4                 ; INCREMENT THE PC BY 4
U 1292, 0814,0038,0180,09E8,0000,1293              BMX/PC,ALU/B,D_ALU,RC[OD]_ALU ; READ THE PC THROUGH THE BMX
U 1293, 0019,2014,11C0,09F0,0000,1294              ALU_Q+K[.4],Q_ALU,RC[OE]_ALU ; COMPUTE THE EXPECTED RESULT
U 1294, 001D,2000,0180,0800,0010,1295              ALU_Q-D,CLK.UBCC         ; WAS THE ACTUAL RESULT CORRECT?
U 1295, 0000,013C,0180,0800,0000,1146              Z?
U 1146, 0000,003D,0180,0800,0000,1109      =0      ERROR1
U 1147, 0000,003C,0180,0A18,0010,1296              ALU_R[3],CLK.UBCC
U 1296, 0000,013C,0180,0800,0000,1148              Z?
U 1148, 0018,0000,0580,0A98,0000,1143      =0      R[3]_LA-K[.1],J/VAPC5A
U 1149, 0000,003C,0180,0800,0000,114A              NOP
```

```
                                        ;2631           .PAGE   "TEST 88        VIBA TEST"
                                        ;2632   ;*********************************************************
                                        ;2633   ;++
                                        ;2634   ; TEST  88      VIBA TEST
                                        ;2635   ;       THIS IS A TEST OF THE VIBA. A FLUSH IS DONE
                                        ;2636   ;       INORDER TO LOAD THE VIBA, THEN THE DATA IS LOADED INTO THE
                                        ;2637   ;       PC AND READ BACK THROUGH THE BMX.
                                        ;2638   ;
                                        ;2639   ; ERROR DESCRIPTION
                                        ;2640   ;       EXPECTED DATA
                                        ;2641   ;       ACTUAL DATA
                                        ;2642   ;
                                        ;2643   ;--
                                        ;2644   ;*********************************************************
                                        ;2645   =0
U 114A, 0000,003D,0180,0800,0000,108E   ;2646   VAPC6:  NEWTST
U 114B, 0018,0038,0980,09F8,0000,1297   ;2647           RC[0F]_K[.2]
U 1297, 0018,0038,8D80,0A98,0000,114C   ;2648           R[3]_K[.1F]
U 114C, 0000,003D,0180,0800,0000,10FE   ;2649   =0      ERLOOP
U 114D, 0000,003C,0180,0A18,0082,1298   ;2650   VAPC6A: SC_R[3]
U 1298, 2000,0038,01C0,0800,0200,1299   ;2651           IBC/FLUSH,ALU_MASK,VA_ALU,Q_ALU ; LOAD VIBA
U 1299, 0018,0038,1980,0800,0200,129A   ;2652           ALU_0(K),VA_ALU
U 129A, 0000,003C,0180,0802,0000,129B   ;2653           PCK7PC_IBA              ; LOAD THE VIBA INTO THE PC
U 129B, 0814,0038,0180,09E8,0000,129C   ;2654           BMX/PC_ALU/B,D_ALU,RC[0D]_ALU ; READ THE PC THROUGH THE BMX
U 129C, 0019,2024,0DC0,09F0,0000,129D   ;2655           ALU_Q[ANDNOT]K[.3],RC[0E]_ALU,Q_ALU ; COMPUTE EXPECTED RESULT
U 129D, 001D,2000,0180,0800,0010,129E   ;2656           ALU_Q-D,CLK.UBCC        ; WAS ACTUAL RESULT CORRECT?
U 129E, 0000,013C,0180,0800,0000,114E   ;2657           Z?
U 114E, 0000,003D,0180,0800,0000,1109   ;2658   =0      ERROR1
U 114F, 2003,001C,01C0,0800,0200,129F   ;2659           IBC/FLUSH,ALU_NOT.MASK,VA_ALU,Q_ALU ; LOAD THE VIBA
U 129F, 001B,0000,0580,0800,0200,12A0   ;2660           ALU_0-K[.1],VA_ALU
U 12A0, 0000,003C,0180,0802,0000,12A1   ;2661           PCK7PC_IBA              ; LOAD THE VIBA INTO THE PC
U 12A1, 0814,0038,0180,09E8,0000,12A2   ;2662           BMX/PC_ALU/B,D_ALU,RC[0D]_ALU ; READ THE PC THROUGH THE BMX
U 12A2, 0019,2024,0DC0,09F0,0000,12A3   ;2663           ALU_Q[ANDNOT]K[.3],Q_ALU,RC[0E]_ALU ; COMPUTE EXPECTED RESULT
U 12A3, 001D,2000,0180,0800,0010,12A4   ;2664           ALU_Q-D,CLK.UBCC        ; WAS ACTUAL RESULT CORRECT?
U 12A4, 0000,013C,0180,0800,0000,1150   ;2665           Z?
U 1150, 0000,003D,0180,0800,0000,1109   ;2666   =0      ERROR1
U 1151, 0000,003C,0180,0A18,0010,12A5   ;2667           ALU_R[3],CLK.UBCC
U 12A5, 0000,013C,0180,0800,0000,1152   ;2668           Z?
U 1152, 0018,0000,0580,0A98,0000,114D   ;2669   =0      R[3]_LA-K[.1],J/VAPC6A
U 1153, 0000,003C,0180,0800,0000,1156   ;2670           NOP
```

```
                                      ;2671            .PAGE   "TEST 89        PCSV REGISTER TEST"
                                      ;2672    ;**********************************************************
                                      ;2673    ;++
                                      ;2674    ; TEST  89      PCSV REGISTER TEST
                                      ;2675    ;
                                      ;2676    ; TEST DESCRIPTION
                                      ;2677    ;       THIS IS A TEST OF THE PCSV REGISTER AND THE CONTROLS
                                      ;2678    ;       OF THE UMSC FIELD WHICH LOAD AND READ IT, IRD AND READ.RLOG.
                                      ;2679    ;
                                      ;2680    ; ERROR DESCRIPTION
                                      ;2681    ;       EXPECTED DATA
                                      ;2682    ;       ACTUAL DATA (RLOG BITS MASKED OFF!)
                                      ;2683    ;
                                      ;2684    ;--
                                      ;2685    ;**********************************************************
                                      ;2686    =0
U 1156, 0000,003D,0180,0800,0000,108E ;2687    PC1:    NEWTST
U 1157, 0000,003C,0180,0800,0084,72A6 ;2688            SC_K[.8]
U 12A6, 0803,0010,0180,0800,0000,12A7 ;2689            ALU_MASK+1,D_ALU
U 12A7, 0801,0028,0180,0AA0,0000,12A8 ;2690            D_NOT.D,R[4]_ALU
U 12A8, 0018,0038,0980,09F8,0000,12A9 ;2691            R[0F]_K[.2]
U 12A9, 0018,0038,8D80,0A98,0000,1158 ;2692            R[3]_K[.1F]
U 1158, 0000,003D,0180,0800,0000,10FE ;2693    =0      ERLOOP
U 1159, 0000,003C,0180,0A18,0082,12AB ;2694    PC1A:   SC_R[3]
U 12AB, 0000,0038,01C0,0A20,0200,12AC ;2695            ALU_MASK,VA_ALU,Q_ALU,LAB_R[4] ; LOAD VA
U 12AC, 001C,0034,01C0,09F0,0000,12AD ;2696            ALU_LA[AND]Q,Q_ALU,R[0E]_ALU ; COMPUTE EXPECTED RESULT
U 12AD, 0000,003C,0180,0801,0000,12AE ;2697            PCK7PC_VA                 ; LOAD VA INTO PC
U 12AE, 0000,003C,0180,0800,1000,12AF ;2698            MSC/IRD                   ; LOAD PCSV REGISTER
U 12AF, 0800,0038,0180,0A20,1C00,12B0 ;2699            MSC/READ.RLOG,ALU/B,D_ALU,LAB_R[4] ; READ PCSV
U 12B0, 081C,2034,0180,09E8,0000,12B1 ;2700            ALU_LA[AND]D,D_ALU,R[0D]_ALU ; MASK OFF RLOG STACK DATA
U 12B1, 001D,2000,0180,0800,0010,12B2 ;2701            ALU_Q-D,CLK.UBCC          ; WAS PCSV CORRECT?
U 12B2, 0000,013C,0180,0800,0000,115A ;2702            Z?
U 115A, 0000,003D,0180,0800,0000,1109 ;2703    =0      ERROR1
U 115B, 0003,001C,01C0,0A20,0200,12B3 ;2704            ALU_NOT.MASK,VA_ALU,Q_ALU,LAB_R[4] ; LOAD VA
U 12B3, 001C,0034,01C0,09F0,0000,12B4 ;2705            ALU_LA[AND]Q,Q_ALU,R[0E]_ALU ; COMPUTE EXPECTED RESULT
U 12B4, 0000,003C,0180,0801,0000,12B5 ;2706            PCK7PC_VA                 ; LOAD VA INTO PC
U 12B5, 0000,003C,0180,0800,1000,12B6 ;2707            MSC/IRD                   ; LOAD PCSV REGISTER
U 12B6, 0800,0038,0180,0A20,1C00,12B7 ;2708            MSC/READ.RLOG,ALU/B,D_ALU,LAB_R[4] ; READ PCSV
U 12B7, 081C,2034,0180,09E8,0000,12B8 ;2709            ALU_LA[AND]D,D_ALU,R[0D]_ALU ; MASK OFF RLOG STACK BITS
U 12B8, 001D,2000,0180,0800,0010,12B9 ;2710            ALU_Q-D,CLK.UBCC          ; WAS PC SAVE CORRECT?
U 12B9, 0000,013C,0180,0800,0000,115C ;2711            Z?
U 115C, 0000,003D,0180,0800,0000,1109 ;2712    =0      ERROR1
U 115D, 0000,003C,0180,0A18,0010,12BA ;2713            ALU_R[3],CLK.UBCC
U 12BA, 0000,013C,0180,0800,0000,115E ;2714            Z?
U 115E, 0018,0000,0580,0A98,0000,1159 ;2715    =0      R[3]_LA-K[.1],J/PC1A
U 115F, 0000,003C,0180,0800,0000,1160 ;2716            NOP
```

```
                                         ;2717          .PAGE   "TEST 8A        BEN RLOG STACK EMPTY TEST"
                                         ;2718   ;*************************************************************
                                         ;2719   ;++
                                         ;2720   ; TEST  8A      BEN RLOG STACK EMPTY TEST
                                         ;2721   ;
                                         ;2722   ; TEST DESCRIPTION
                                         ;2723   ;       THIS IS A TEST OF THE RLOG STACK POINTER INCREMENT AND
                                         ;2724   ;       DECREMENT FUNCTION USING THE BEN 15 BIT WHICH SIGNIFIES
                                         ;2725   ;       RLOG DONE (RLOG STACK POINTER=0).
                                         ;2726   ;
                                         ;2727   ; ERROR DESCRIPTION
                                         ;2728   ;       EXPECTED STACK POINTER VALUE
                                         ;2729   ;
                                         ;2730   ;--
                                         ;2731   ;*************************************************************
                                         ;2732   =0
U 1160, 0000,003D,0180,0800,0000,108E    ;2733   RLOGB1: NEWTST
U 1161, 0018,0038,0580,09F8,0000,12BB    ;2734           RC[OF]_K[.1]
U 12BB, 0000,003C,0180,0800,1000,12BC    ;2735           MSC/IRD                  ; MSC/IRD WILL CLEAR THE RLOG STACK POINTER
U 12BC, 0018,0038,1980,09F0,0000,12BD    ;2736           RC[OE]_K[ZERO]
U 12BD, 0000,153C,0180,0800,0000,1007    ;2737           RLOG.EMPTY?              ; BRANCH BIT=1
U 1007, 0000,003D,0180,0800,0000,1109    ;2738   =0111   ERROR1                   ; RLOG EMPTY BRANCH BIT INCORRECT
                                         ;2739                                    ; WITH RLOG STACK=0
U 100F, 0F00,003C,0180,0800,0000,1162    ;2740           D_0
U 1162, 0000,003D,0180,0800,0000,101E    ;2741   =0      CALL,J/DCE
U 1163, 0001,003C,0180,0A88,0000,12BE    ;2742           R[1]_D                   ; SET UP A COUNTER, R[1]=0E
U 12BE, 0000,0004,0180,0800,0000,12BF    ;2743   RLOGB2: ALU/A-B.RLOG             ; INCREMENT THE RLOG STACK POINTER
U 12BF, 0800,003C,0180,0A08,0000,12C0    ;2744           D_R[1]                   ; FROM 1 TO OF AND TEST THE RLOG
U 12C0, 0018,0038,61C0,0800,0000,12C1    ;2745           Q_K[.F]                  ; STACK POINTER=0 BRANCH FOR EACH VALUE
U 12C1, 001D,2000,0180,09F0,0000,12C2    ;2746           A[U_Q-D,RC[OE]_ALU
U 12C2, 0000,153C,0180,0800,0000,1047    ;2747           RLOG.EMPTY?              ; BRANCH BIT=0
U 1047, 0000,003C,0180,0800,0000,12C3    ;2748   =0111   J/RLOGB3
U 104F, 0000,003D,0180,0800,0000,1109    ;2749           ERROR1                   ; RLOG STACK POINTER=0 U BRANCH FAILED
                                         ;2750                                    ; WITH STACK POINTER NOT 0
U 12C3, 0000,003C,0180,0A08,0010,12C4    ;2751   RLOGB3: ALU_R[1],CLK.UBCC
U 12C4, 0000,013C,0180,0800,0000,1164    ;2752           Z?
U 1164, 0018,0000,0580,0A88,0000,12BE    ;2753   =0      R[1]_LA-K[.1],J/RLOGB2
U 1165, 0000,0004,0180,0800,0000,12C5    ;2754           ALU/A-B.RLOG             ; INCREMENT THE STACK POINTER FROM OF TO 00
U 12C5, 0018,0038,1980,09F0,0000,12C6    ;2755           RC[OE]_K[ZERO]
U 12C6, 0000,153C,0180,0800,0000,1057    ;2756           RLOG.EMPTY?              ; BRANCH BIT=1
U 1057, 0000,003D,0180,0800,0000,1109    ;2757   =0111   ERROR1                   ; RLOG STACK U BRANCH FAILED WITH
                                         ;2758                                    ; STACK POINTER=0
U 105F, 0F00,003C,0180,0800,0000,1166    ;2759           D_0
U 1166, 0000,003D,0180,0800,0000,101E    ;2760   =0      CALL,J/DCE
U 1167, 0001,003C,0180,0A88,0000,12C7    ;2761           R[1]_D                   ; SET UP A COUNTER, R[1]=0E
U 12C7, 0000,0038,0180,0800,1C00,12C8    ;2762   RLOGB4: ALU_RLOG                 ; DECREMENT THE RLOG STACK POINTER
U 12C8, 0800,003C,0180,0A08,0000,12C9    ;2763           D_R[1]                   ; FROM OF TO 1 AND CHECK THE
U 12C9, 0019,0014,0580,09F0,0000,12CA    ;2764           A[U_D+K[.1],RC[OE]_ALU   ; BRANCH BIT FOR EACH VALUE
U 12CA, 0000,153C,0180,0800,0000,1077    ;2765           RLOG.EMPTY?              ; BRANCH BIT=0
U 1077, 0000,003C,0180,0800,0000,12CB    ;2766   =0111   J/RLOGB5
U 107F, 0000,003D,0180,0800,0000,1109    ;2767           ERROR1                   ; BRANCH BIT INCORRECT WITH
                                         ;2768                                    ; STACK POINTER NOT 0
U 12CB, 0000,003C,0180,0A08,0010,12CC    ;2769   RLOGB5: ALU_R[1],CLK.UBCC
U 12CC, 0000,013C,0180,0800,0000,1168    ;2770           Z?
U 1168, 0018,0000,0580,0A88,0000,12C7    ;2771   =0      R[1]_LA-K[.1],J/RLOGB4
```

```
U 1169, 0000,0038,0180,0800,1C00,12CD   ;2772            ALU_RLOG                ; DECREMENT THE RLOG STACK POINTER FROM 1 TC 0
U 12CD, 0018,0038,1980,09F0,0000,12CE   ;2773            RC[0E]_K[ZERO]
U 12CE, 0000,153C,0180,0800,0000,1097   ;2774            RLOG.EMPTY?             ; BRANCH BIT=1
U 1097, 0000,003D,0180,0800,0000,1109   ;2775    =0111   ERROR1                  ; BRANCH BIT INCORRECT WITH
                                        ;2776                                    ; STACK POINTER=0
U 109F, 0000,0038,0180,0800,1C00,12CF   ;2777            ALU_RLOG                ; DECREMENT THE STACK POINTER FROM 0 TO OF
U 12CF, 0000,003C,0180,0800,1000,12D0   ;2778            MSC7IRD                 ; SHOULD PUT 0 INTO THE STACK POINTER
U 12D0, 0000,153C,0180,0800,0000,10B7   ;2779            RLOG.EMPTY?             ; BRANCH BIT SHOULD BE 1.
U 10B7, 0000,003D,0180,0800,0000,1109   ;2780    =0111   ERROR1                  ; MSC/IRD FAILED TO CLEAR RLOG STACK POINTER
U 10BF, 0000,003C,0180,0800,0000,116A   ;2781            NOP
```

```
                                           ;2782          .PAGE   "TEST 8B        RLOG STACK TEST"
                                           ;2783   ;*********************************************************
                                           ;2784   ;++
                                           ;2785   ; TEST  8B      RLOG STACK TEST
                                           ;2786   ;
                                           ;2787   ; TEST DESCRIPTION
                                           ;2788   ;       THIS IS A TEST OF THE RLOG STACK AND RLOG
                                           ;2789   ;       STACK POINTER. THE WAY EACH LOCATION IN THE STACK
                                           ;2790   ;       IS TESTED IS BY FIRST WRITING A COUNT PATTERN
                                           ;2791   ;       INTO EACH OF THE LOCATIONS UP TO THE ONE IN
                                           ;2792   ;       THE STACK WHICH IS BEING TESTED. THEN THAT LOCATION
                                           ;2793   ;       BEING TESTED IS WRITTEN AND READ WITH  MANY DATA
                                           ;2794   ;       PATTERNS THEN AFTER CHECKING
                                           ;2795   ;       EACH OF THESE PATTERNS THE STACK POINTER IS DECRIMENTED
                                           ;2796   ;       DOWN TO 0 AND EACH OF THE OTHER LOCATIONS IS CHECKED TO
                                           ;2797   ;       INSURE THAT THEY STILL CONTAIN THE COUNT PATTERN WHICH
                                           ;2798   ;       WAS ORIGINALLY WRITTEN INTO THEM.
                                           ;2799   ;
                                           ;2800   ; ERROR DESCRIPTION
                                           ;2801   ;       EXPECTED DATA
                                           ;2802   ;       GOT DATA
                                           ;2803   ;       ADDRESS READ IN RLOG
                                           ;2804   ;       0
                                           ;2805   ;
                                           ;2806   ;--
                                           ;2807   ;*********************************************************
                                           ;2808   =0
U 116A, 0000,003D,0180,0800,0000,108E      ;2809   RLOG:   NEWTST
U 116B, 0003,003C,0180,0A98,0000,12D1      ;2810           R[3]_0
U 12D1, 0018,0038,1180,09F8,0000,12D2      ;2811           RC[0F]_K[.4]
U 12D2, 0018,0038,6180,0A90,0000,12D3      ;2812           R[2]_K[.F]              ; INITIALIZE SOME COUNTERS.
U 12D3, 0003,003C,0180,09D8,0000,116C      ;2813           RC[0B]_0
U 116C, 0000,003D,0180,0800,0000,10FE      ;2814   =0      ERLOOP
U 116D, 0000,003C,0180,0800,0000,116E      ;2815           NOP
                                           ;2816   =0
U 116E, 0F00,003D,0180,0800,0000,11EB      ;2817   RLOG1:  D_0,CALL,J/DCAAAA       ; SET UP THE PC
U 116F, 0001,003C,0180,0801,0200,1170      ;2818           PC&VA_D                 ; PC=0000AAAA
U 1170, 0F00,003D,0180,0800,0000,101A      ;2819   =0      D_0,CALL,J/DCA
U 1171, 0000,003C,0180,0800,0000,1172      ;2820           NOP
U 1172, 0000,003D,0180,0800,0000,101A      ;2821   =0      CALL,J/DCA
U 1173, 0001,003C,0180,0AE8,0000,12D4      ;2822           R[0D]_D
U 12D4, 0000,003C,0180,0800,1000,12D5      ;2823           MSC/IRD                 ; CLEAR THE RLOG STACK POINTER
U 12D5, 0F00,003C,0180,0800,0000,12D6      ;2824           D_0
U 12D6, 0001,003C,0180,0800,0082,12D7      ;2825   RLOG2:  SC_D                    ; INCREMENT THE STACK POINTER
U 12D7, 0001,0004,1D80,0A00,0000,12D8      ;2826           LAB_R[0],ALU/A-B.RLOG,K[SC],AMX/RAMX ; AND WRITE A COUNT
U 12D8, 0000,003C,0180,0A18,0000,12D9      ;2827           LAB_R[3]                ; PATTERN INTO EACH STACK
U 12D9, 001C,2000,0180,0800,0010,12DA      ;2828           ALU_LA[A-B]D,CLK.UBCC   ; LOCATIONS KMX FIELD
                                           ;2829                                   ; THIS IS DONE FOR EACH
                                           ;2830                                   ; LOCATION IN THE STACK ALL
                                           ;2831                                   ; THE WAY UP TO AND INCLUDING
                                           ;2832                                   ; THE LOCATION CURRENTLY BEING TESTED.
U 12DA, 0000,013C,0180,0800,0000,1174      ;2833           Z?
U 1174, 0819,0014,0580,0800,0000,12D6      ;2834   =0      D_D+K[.1],J/RLOG2
U 1175, 0000,003C,0180,0A18,0000,12DB      ;2835           LAB_R[3]                ; GO COMPUTE THE EXPECTED
U 12DB, 0003,003C,0180,09D8,0000,12DC      ;2836           RC[0B]_0                ; DATA IN THE LOCATION
```

```
U 12DC, 0000,003C,0180,09E0,0000,12DD   ;2837           RC[OC]_LA               ; CURRENTLY BEING TESTED
U 12DD, 0000,003C,0180,0AD0,0000,12DE   ;2838           R[OA]_[A
U 12DE, 0003,003C,0180,0AD8,0000,12DF   ;2839           R[OB]_0
U 12DF, 0003,003C,0180,0AE0,0000,1176   ;2840           R[OC]_0
U 1176, 0000,003D,0180,0800,0000,11A4   ;2841   =0      CALL,J/COMRLG
U 1177, 0001,003C,0180,09F0,0000,12E0   ;2842           RC[OE]_D
U 12E0, 0000,0038,01C0,09E8,1C00,12E1   ;2843           ALU_RLOG,Q_ALU,RC[OD]_ALU ; READ THE LOCATION BEING TEST AND
U 12E1, 001D,2000,0180,0800,0010,12E2   ;2844           ALU_Q-D,CLK.UBCC        ; CHECK THE RESULT: RA[O], ALU/A-B
                                        ;2845                                   ; SC=STACK POINTER VALUE
U 12E2, 0000,013C,0180,0800,0000,1178   ;2846           Z?
U 1178, 0000,003D,0180,0800,0000,1109   ;2847   =0      ERROR1                  ; LOCATION BEING TEST DIDN'T
                                        ;2848                                   ; READ OR GET WRITTEN
                                        ;2849                                   ; WITH COUNT PATTERN.
U 1179, 0001,0004,6180,0A78,0000,12E3   ;2850   RLOGA:  ALU/A-B.RLOG,LAB_R[OF],K[.F],AMX/RAMX ; WRITE THE LOCATION BEING
                                        ;2851                                   ; TESTED WITH: RA[OF], K[.F] AND ALU/A-B
U 12E3, 0018,0038,6180,0AD0,0000,12E4   ;2852           R[OA]_K[.F]             ; COMPUTE THE EXPECTED RESULT
U 12E4, 0018,0038,6180,0AD8,0000,12E5   ;2853           R[OB]_K[.F]
U 12E5, 0003,003C,0180,0AE0,0000,117A   ;2854           R[OC]_0
U 117A, 0000,003D,0180,0800,0000,11A4   ;2855   =0      CALL,J/COMRLG
U 117B, 0001,003C,0180,09F0,0000,12E6   ;2856           RC[OE]_D
U 12E6, 0000,0038,01C0,09E8,1C00,12E7   ;2857           ALU_RLOG,Q_ALU,RC[OD]_ALU ; READ THE RESULT
U 12E7, 001D,2000,0180,0800,0010,12E8   ;2858           ALU_Q-D,CLK.UBCC        ; RESULT CORRECT?
U 12E8, 0000,013C,0180,0800,0000,117C   ;2859           Z?
U 117C, 0000,003D,0180,0800,0000,1109   ;2860   =0      ERROR1                  ; RLOG STACK LOCATION NOT CORRECT
U 117D, 0001,0018,1980,0A00,0000,12E9   ;2861   RLOGB:  ALU/A+B.RLOG,LAB_R[O],K[ZERO],AMX/RAMX ; WRITE THE LOCATION
                                        ;2862                                   ; BEING TESTED WITH RA[O], K[ZERO] AND ALU/A+B
U 12E9, 0003,003C,0180,0AD0,0000,12EA   ;2863           R[OA]_0                 ; COMPUTE THE EXPECTED RESULT
U 12EA, 0003,003C,0180,0AD8,0000,12EB   ;2864           R[OB]_0
U 12EB, 001B,0000,0580,0AE0,0000,117E   ;2865           ALU_0-K[.1],R[OC]_ALU
U 117E, 0000,003D,0180,0800,0000,11A4   ;2866   =0      CALL,J/COMRLG
U 117F, 0001,003C,0180,09F0,0000,12EC   ;2867           RC[OE]_D
U 12EC, 0000,0038,01C0,09E8,1C00,12ED   ;2868           ALU_RLOG,Q_ALU,RC[OD]_ALU ; READ THE RESULT
U 12ED, 001D,2000,0180,0800,0010,12EE   ;2869           ALU_Q-D,CLK.UBCC        ; WAS THE RESULT CORRECT?
U 12EE, 0000,013C,0180,0800,0000,1180   ;2870           Z?
U 1180, 0000,003D,0180,0800,0000,1109   ;2871   =0      ERROR1                  ; RLOG STACK LOCATION INCORRECT
                                        ;2872   ; THIS LOOP WRITES THE LOCATION BEING TESTED WITH
                                        ;2873   ;       RA[O]
                                        ;2874   ;       KMX<3:0>=COUNT PATTERN
                                        ;2875   ;       ALU/A-B
U 1181, 0018,0038,6180,0AB0,0000,12EF   ;2876           R[6]_K[.F]              ; INITIALIZE A COUNTER
U 12EF, 0018,0038,1980,0AB8,0000,12F0   ;2877           R[7]_K[ZERO]            ; AND THE KMX DATA PATTERN
U 12F0, 0003,003C,0180,0AD8,0000,12F1   ;2878           R[OB]_0
U 12F1, 0003,003C,0180,0AE0,0000,12F2   ;2879           R[OC]_0
U 12F2, 0000,003C,0180,0A38,0082,12F3   ;2880   RLOGC:  SC_R[7]
U 12F3, 0000,003C,0180,0AD0,0000,12F4   ;2881           R[OA]_LA
U 12F4, 0001,0004,1D80,0A00,0000,1182   ;2882           ALU/A-B.RLOG,LAB_R[O],K[SC],AMX/RAMX ; TEST INSTRUCTION, WRITE THE RLOG
U 1182, 0000,003D,0180,0800,0000,11A4   ;2883   =0      CALL,J/COMRLG           ; GO COMPUTE THE EXPECTED RESULT
U 1183, 0001,003C,0180,09F0,0000,12F5   ;2884           RC[OE]_D
U 12F5, 0000,0038,01C0,09E8,1C00,12F6   ;2885           ALU_RLOG,Q_ALU,RC[OD]_ALU ; READ THE ACTUAL RESULT
U 12F6, 001D,2000,0180,0800,0010,12F7   ;2886           ALU_Q-D,CLK.UBCC        ; WAS IT CORRECT?
U 12F7, 0000,013C,0180,0800,0000,1184   ;2887           Z?
U 1184, 0000,003D,0180,0800,0000,1109   ;2888   =0      ERROR1                  ; RLOG STACK LOCATION INCORRECT.
U 1185, 0000,003C,0180,0A38,0000,12F8   ;2889           LAB_R[7]                ; INCREMENT KMX DATA PATTERN
U 12F8, 0018,0014,0580,0AB8,0000,12F9   ;2890           R[7]_LA+K[.1]
U 12F9, 0000,003C,0180,0A30,0010,12FA   ;2891           ALU_R[6],CLK.UBCC       ; TRIED ALL PATTERNS?
```

```
U 12FA, 0000,013C,0180,0800,0000,1186   ;2892           Z?
U 1186, 0018,0000,0580,0AB0,0000,12F2   ;2893   =0      R[6]_LA-K[.1],J/RLOGC   ; IF NOT CONTINUE
U 1187, 0000,003C,0180,0800,0000,12FB   ;2894           NOP
                                        ;2895   ; THIS LOOP WRITES THE LOCATION BEING TESTED WITH:
                                        ;2896   ;       RA ADDRESS=COUNT PATTERN
                                        ;2897   ;       KMX<3:0>=0
                                        ;2898   ;       ALU/A-B
U 12FB, 0018,0038,6180,0AB0,0000,12FC   ;2899           R[6]_K[.F]              ; INITIALIZE A COUNTER AND
U 12FC, 0018,0038,1980,0AB8,0000,12FD   ;2900           R[7]_K[ZERO]            ; THE RA ADDRESS
U 12FD, 0003,003C,0180,0AD0,0000,12FE   ;2901           R[0A]_0
U 12FE, 0003,003C,0180,0AE0,0000,12FF   ;2902           R[0C]_0
U 12FF, 0000,003C,0180,0A38,0082,1300   ;2903   RLOGD:  SC_R[7]
U 1300, 0000,003C,0180,0AD8,0000,1301   ;2904           R[0B]_LA
U 1301, 0001,0004,1980,0868,0000,1188   ;2905           ALU/A-B.RLOG,LAB_R(SC),K[ZERO],AMX/RAMX ; WRITE THE RLOG
U 1188, 0000,003D,0180,0800,0000,11A4   ;2906   =0      CALL,J/COMRLG           ; GO COMPUTE THE EXPECTED RESULT
U 1189, 0001,003C,0180,09F0,0000,1302   ;2907           RC[0E]_D
U 1302, 0000,0038,01C0,09E8,1C00,1303   ;2908           ALU_RLOG,Q_ALU,RC[0D]_ALU ; GET THE ACTUAL RESULT
U 1303, 001D,2000,0180,0800,0010,1304   ;2909           ALU_Q-D,CLK.UBCC        ; WAS IT CORRECT
U 1304, 0000,013C,0180,0800,0000,118A   ;2910           Z?
U 118A, 0000,003D,0180,0800,0000,1109   ;2911   =0      ERROR1                  ; RLOG STACK LOCATION INCORRECT
U 118B, 0000,003C,0180,0A38,0000,1305   ;2912           LAB_R[7]                ; INCREMENT THE RA ADDRESS
U 1305, 0018,0014,0580,0AB8,0000,1306   ;2913           R[7]_LA+K[.1]
U 1306, 0000,003C,0180,0A30,0010,1307   ;2914           ALU_R[6],CLK.UBCC       ; TRIED ALL RA ADDRESSES?
U 1307, 0000,013C,0180,0800,0000,118C   ;2915           Z?
U 118C, 0018,0000,0580,0AB0,0000,12FF   ;2916   =0      R[6]_LA-K[.1],J/RLOGD   ; IF NOT CONTINUE
U 118D, 0000,003C,0180,0800,0000,1308   ;2917           NOP
                                        ;2918   ; THIS LOOP WRITES THE RLOG LOCATION BEING TESTED WITH:
                                        ;2919   ;       RA[0F]
                                        ;2920   ;       KMX<3:0>=COUNT PATTERN
                                        ;2921   ;       ALU/A+B
U 1308, 0018,0038,6180,0AB0,0000,1309   ;2922           R[6]_K[.F]              ; INITIALIZE A COUNTER AND
U 1309, 0018,0038,1980,0AB8,0000,130A   ;2923           R[7]_K[ZERO]            ; THE KMX DATA PATTERN
U 130A, 0018,0038,6180,0AD8,0000,130B   ;2924           R[0B]_K[.F]
U 130B, 001B,0000,0580,0AE0,0000,130C   ;2925           ALU_0-K[.1],R[0C]_ALU
U 130C, 0000,003C,0180,0A38,0082,130D   ;2926   RLOGE:  SC_R[7]
U 130D, 0000,003C,0180,0AD0,0000,130E   ;2927           R[0A]_LA
U 130E, 0001,0018,1D80,0A78,0000,118E   ;2928           ALU/A+B.RLOG,LAB_R[0F],K[SC],AMX/RAMX ; WRITE THE RLOG
U 118E, 0000,003D,0180,0800,0000,11A4   ;2929   =0      CALL,J/COMRLG           ; GO COMPUTE THE EXPECTED RESULT
U 118F, 0001,003C,0180,09F0,0000,130F   ;2930           RC[0E]_D
U 130F, 0000,0038,01C0,09E8,1C00,1310   ;2931           ALU_RLOG,Q_ALU,RC[0D]_ALU ; READ THE ACTUAL RESULT
U 1310, 001D,2000,0180,0800,0010,1311   ;2932           ALU_Q-D,CLK.UBCC        ; WAS THE RESULT CORRECT?
U 1311, 0000,013C,0180,0800,0000,1190   ;2933           Z?
U 1190, 0000,003D,0180,0800,0000,1109   ;2934   =0      ERROR1                  ; RLOG STACK LOCATION INCORRECT
U 1191, 0000,003C,0180,0A38,0000,1312   ;2935           LAB_R[7]                ; INCREMENT THE KMX DATA PATTERN
U 1312, 0018,0014,0580,0AB8,0000,1313   ;2936           R[7]_LA+K[.1]
U 1313, 0000,003C,0180,0A30,0010,1314   ;2937           ALU_R[6],CLK.UBCC       ; TRIED ALL KMX PATTERNS YET?
U 1314, 0000,013C,0180,0800,0000,1192   ;2938           Z?
U 1192, 0018,0000,0580,0AB0,0000,130C   ;2939   =0      R[6]_LA-K[.1],J/RLOGE   ; IF NOT CONTINUE.
U 1193, 0000,003C,0180,0800,0000,1315   ;2940           NOP
                                        ;2941   ; THIS LOOP WRITES THE RLOG LOCATION BEING TESTED WITH
                                        ;2942   ;       RA ADDRESS=COUNT PATTERN
                                        ;2943   ;       KMX<3:0>=0F
                                        ;2944   ;       ALU/A+B
U 1315, 0018,0038,6180,0AB0,0000,1316   ;2945           R[6]_K[.F]              ; INITIALIZE A COUNTER AND
U 1316, 0018,0038,1980,0AB8,0000,1317   ;2946           R[7]_K[ZERO]            ; THE RA ADDRESS
```

```
U 1317, 0018,0038,6180,0AD0,0000,1318    ;2947            R[0A]_K[.F]
U 1318, 001B,0000,0580,0AE0,0000,1319    ;2948            ALU_0-K[.1],R[0C]_ALU
U 1319, 0000,003C,0180,0A38,0082,131A    ;2949   RLOGF:   SC_R[7]
U 131A, 0000,003C,0180,0AD8,0000,131B    ;2950            R[0B]_LA
U 131B, 0001,0018,6180,0868,0000,1194    ;2951            ALU/A+B.RLOG,LAB_R(SC),K[.F],AMX/RAMX ; WRITE THE RLOG
U 1194, 0000,003D,0180,0800,0000,11A4    ;2952   =0       CALL,J/COMRLG             ; GO COMPUTE THE EXPECTED RESULT
U 1195, 0001,003C,0180,09F0,0000,131C    ;2953            RC[0E]_D
U 131C, 0000,0038,01C0,09E8,1C00,131D    ;2954            ALU_RLOG,Q_ALU,RC[0D]_ALU ; GET THE ACTUAL RESULT
U 131D, 001D,2000,0180,0800,0010,131E    ;2955            ALU_Q-D,CLK.UBCC          ; WAS THE RESULT CORRECT?
U 131E, 0000,013C,0180,0800,0000,1196    ;2956            Z?
U 1196, 0000,003D,0180,0800,0000,1109    ;2957   =0       ERROR1                    ; RLOG STACK LOCATION INCORRECT.
U 1197, 0000,003C,0180,0A38,0000,131F    ;2958            LAB_R[7]                  ; INCREMENT THE RA ADDRESS
U 131F, 0018,0014,0580,0AB8,0000,1320    ;2959            R[7]_LA+K[.1]
U 1320, 0000,003C,0180,0A30,0010,1321    ;2960            ALU_R[6],CLK.UBCC         ; TRIED ALL ADDRESSES?
U 1321, 0000,013C,0180,0800,0000,1198    ;2961            Z?
U 1198, 0018,0000,0580,0AB0,0000,1319    ;2962   =0       R[6]_LA-K[.1],J/RLOGF     ; IF NOT CONTINUE
                                         ;2963   ; WRITE THE [OCATION JUST TESTED WITH: RA]OF], K[.F] AND ALU/A+B
U 1199, 0001,0018,6180,0A78,0000,1322    ;2964            LAB_R[0F],ALU/A+B.RLOG,K[.F],AMX/RAMX
U 1322, 0000,0038,0180,0800,1C00,1323    ;2965            ALU_RLOG                  ; READ THIS CFF THE STACK
U 1323, 0000,003C,0180,0A18,0010,1324    ;2966            ALU_R[3],CLK.UBCC         ; WAS THE LOCATION JUST TESTED LOCATION 0?
U 1324, 0000,013C,0180,0800,0000,119A    ;2967            Z?
U 119A, 0018,0000,0580,0AA0,0000,1325    ;2968   =0       R[4]_LA-K[.1],J/RLOG3     ; IF IT WAS NOT LOCATION 0
                                         ;2969                                      ; GO READ ALL THE OTHER LOCATION
                                         ;2970                                      ; BELOW THE LOCATION JUST TESTED
                                         ;2971                                      ; BY DECREMENTING THE STACK POINTER
                                         ;2972                                      ; AND CHECKING THE KMX FIELD
                                         ;2973                                      ; FOR THE COUNT PATTERN ORIGINALLY
                                         ;2974                                      ; WRITTEN INTO THEM
U 119B, 0000,003C,0180,0800,0000,11A1    ;2975            J/RLOG35                  ; IF LOCATION 0 WAS JUST TESTED
                                         ;2976                                      ; GO TEST LOCATION 1
                                         ;2977   ; THIS LOOP DECREMENTS THE RLOG STACK POINTER AND
                                         ;2978   ; READS ALL THE LOCATIONS BELOW THE LOCATION JUST TESTED WHICH WERE
                                         ;2979   ; WRITTEN WITH :
                                         ;2980   ;        RA[0]
                                         ;2981   ;        K<3:0>=COUNT PATTERN=RLOG STACK POINTER VALUE OF THIS LOCATION
                                         ;2982   ;        ALU/A-B
U 1325, 0000,003C,0180,0A20,0000,1326    ;2983   RLOG3:   LAB_R[4]                  ; GO COMPUTE THE EXPECTED
U 1326, 0000,003C,0180,0AD0,0000,1327    ;2984            R[0A]_LA                  ; CONTENTS OF THIS LOCATION
U 1327, 0000,003C,0180,09E0,0000,1328    ;2985            RC[0C]_LA
U 1328, 0003,003C,0180,0AD8,0000,1329    ;2986            R[0B]_0
U 1329, 0003,003C,0180,0AE0,0000,119C    ;2987            R[0C]_0
U 119C, 0000,003D,0180,0800,0000,11A4    ;2988   =0       CALL,J/COMRLG
U 119D, 0001,003C,0180,09F0,0000,132A    ;2989            RC[0E]_D
U 132A, 0000,0038,01C0,09E8,1C00,132B    ;2990            ALU_RLOG,Q_ALU,RC[0D]_ALU ; READ THE RLOG STACK
U 132B, 001D,2000,0180,0800,0010,132C    ;2991            ALU_Q-D,CLK.UBCC          ; IS THIS LOCATION CORRECT?
U 132C, 0000,013C,0180,0800,0000,119E    ;2992            Z?
U 119E, 0000,003D,0180,0800,0000,1109    ;2993   =0       ERROR1                    ; RLOG STACK LOCATION INCORRECT. NOTE
                                         ;2994                                      ; THAT THIS ERROR INDICATES
                                         ;2995                                      ; AN ADDRESSING (NOT DATA) ERROR
                                         ;2996                                      ; IN THE RLOG STACK
U 119F, 0000,003C,0180,0A20,0010,132D    ;2997            ALU_R[4],CLK.UBCC         ; TESTED ALL LOCATIONS?
U 132D, 0000,013C,0180,0800,0000,11A0    ;2998            Z?
U 11A0, 0018,0000,0580,0AA0,0000,1325    ;2999   =0       R[4]_LA-K[.1],J/RLOG3     ; IF NOT CONTINUE.
U 11A1, 0000,003C,0180,0A18,0000,132E    ;3000   RLOG35:  LAB_R[3]                  ; INCREMENT THE POINTER TO THE
U 132E, 0018,0014,0580,0A98,0000,132F    ;3001            R[3]_LA+K[.1]             ; RLOG STACK LOCATION CURRENTLY BEING TESTED
```

```
U 132F, 0000,003C,0180,0A10,0010,1330   ;3002           ALU_R[2],CLK.UBCC       ; ALL LOCATIONS TESTED?
U 1330, 0000,013C,0180,0800,0000,11A2   ;3003           Z?
U 11A2, 0018,0000,0580,0A90,0000,116E   ;3004   =0      R[2]_LA-K[.1],J/RLOG1   ; IF NOT CONTINUE
U 11A3, 0000,003C,0180,0800,0000,1336   ;3005           J/RLOG4
                                        ;3006   ; THIS SUBROUTINE IS USED TO COMPUTE THE EXPECTED RLOG
                                        ;3007   ; DATA. BEFORE CALLING THE RA SCRATCH PADS MUST
                                        ;3008   ; BE IN THE STATE:
                                        ;3009   ;
                                        ;3010   ;       R[0A] = KMX
                                        ;3011   ;       R[0B] = RA ADDRESS
                                        ;3012   ;       R[0C] = -1/0 = ADD/SUB
                                        ;3013   ;
                                        ;3014   ; THE RESULT IS LEFT IN D AND R[0E]
                                        ;3015   ;
                                        ;3016   =0
U 11A4, 0800,003D,0180,0A50,0000,1010   ;3017   COMRLG: D_R[0A],CALL,J/DCO
U 11A5, 0000,003C,01C0,0A58,0000,1331   ;3018           Q_R[0B]
U 1331, 081D,2030,0180,0800,0000,11A6   ;3019           ALU_Q[OR]D,D_ALU
U 11A6, 0100,003D,0180,0800,0000,1010   ;3020   =0      D_D.LEFT2,SI7ZERO,CALL,J/DCO
U 11A7, 0100,003C,0180,0800,0000,1332   ;3021           D_D.LEFT2,SI/ZERO
U 1332, 0000,003C,6580,0800,0084,7333   ;3022           SC_K[.10]
U 1333, 0000,003C,0180,0A60,0010,1334   ;3023           ALU_R[0C],CLK.UBCC
U 1334, 0000,013C,0180,0800,0000,11A8   ;3024           Z?
U 11A8, 0801,001C,0180,0800,0000,11A9   ;3025   =0      ALU_D.ORNOT.MASK,D_ALU
U 11A9, 0000,003C,0180,0A68,0000,1335   ;3026           LAB_R[0D]
U 1335, 081C,2032,0180,0AF0,0000,0001   ;3027           ALU_LA[OR]D,D_ALU,R[0E]_ALU,RETURN1
U 1336, 0000,003C,0180,0800,0000,11AA   ;3028   RLOG4:  NOP
```

```
                                            ;3029          .PAGE  "TEST 8C        BEN EALU.N TEST"
                                            ;3030   ;*******************************************************************
                                            ;3031   ;++
                                            ;3032   ; TEST  8C      BEN EALU.N TEST
                                            ;3033   ;
                                            ;3034   ; TEST DESCRIPTION
                                            ;3035   ;         THIS IS A TEST OF THE BEN 12 BIT WHICH IS DETERMINED BY
                                            ;3036   ;         THE EALU N BIT (EALU BIT <09> AS STORED IN THE UCC).
                                            ;3037   ;
                                            ;3038   ; ERROR DESCRIPTION
                                            ;3039   ;         DATA AT EALU OUTPUT WHEN THE UBCC ARE CLOCKED
                                            ;3040   ;         ERROR CODE:
                                            ;3041   ;                 0=> BEN FAILED TO BE DEASSERTED
                                            ;3042   ;                 1=> BEN FAILED TO BE ASSERTED
                                            ;3043   ;
                                            ;3044   ;--
                                            ;3045   ;*******************************************************************
                                            ;3046   =0
U 11AA, 0000,003D,0180,0800,0000,108E       ;3047   EALUN1: NEWTST
U 11AB, 0018,0038,0980,09F8,0000,1337       ;3048           RC[0F]_K[.2]
U 1337, 0018,0038,6180,0AA0,0000,1338       ;3049           R[4]_K[.F]                  ; SET UP A COUNTER
U 1338, 0000,003C,D980,0800,0084,7339       ;3050           SC_K[.9]                    ; GENERATE A MASK
U 1339, 0003,001C,0180,0AA8,0000,11AC       ;3051           ALU_NOT.MASK,R[5]_ALU       ; R[5]=200 (HEX)
U 11AC, 0000,003D,0180,0800,0000,10FE       ;3052   =0      ERLOOP
U 11AD, 0000,003C,0180,0A20,0082,133A       ;3053   EALUN2: SC_R[4]                     ; GENERATE TEST DATA
U 133A, 0800,003C,0180,0A28,0000,133B       ;3054           D_R[5]                      ; CALCULATE THE RESULT
U 133B, 0801,0024,0180,0800,0000,133C       ;3055           ALU_D.ANDNOT.MASK,D_ALU
U 133C, 0003,001C,0180,09F0,0082,133D       ;3056           ALU_NOT.MASK,SC_ALU,RC[0E]_ALU ; LOAD TEST DATA INTO SC
U 133D, 0001,003C,0180,0800,0010,133E       ;3057           ALU_D,CLK.UBCC
U 133E, 0000,013C,0180,0800,0000,11AE       ;3058           Z?
U 11AE, 0000,003C,0180,0800,0000,1340       ;3059   =0      J/EALUN3
U 11AF, 0000,003C,0180,0800,0110,133F       ;3060           FE_SC,CLK.UBCC              ; CLOCK THE UBCC
U 133F, 0003,123C,0180,09E8,0000,10C7       ;3061           EALU.N?,RC[0D]_0            ; BRANCH BIT=EALU.N=0
U 10C7, 0000,003C,0180,0800,0000,10DF       ;3062   =0111   J/EALUN4
U 10CF, 0000,003D,0180,0800,0000,1109       ;3063           ERROR1                      ; BRANCH ASSERTED!
U 1340, 0000,003C,0180,0800,0110,1341       ;3064   EALUN3: FE_SC,CLK.UBCC              ; TEST INSTRUCTION. CLOCK THE UBCC
U 1341, 0018,1238,0580,09E8,0000,10D7       ;3065           EALU.N?,RC[0D]_K[.1]        ; BRANCH BIT=EALU.N=1
U 10D7, 0000,003D,0180,0800,0000,1109       ;3066   =0111   ERROR1                      ; BRANCH NOT ASSERTED!
U 10DF, 0000,003C,0180,0A20,0010,1342       ;3067   EALUN4: ALU_R[4],CLK.UBCC           ; DONE TESTING?
U 1342, 0000,013C,0180,0800,0000,11B0       ;3068           Z?
U 11B0, 0018,0000,0580,0AA0,0000,11AD       ;3069   =0      R[4]_LA-K[.1],J/EALUN2  ; IF NOT DECREMENT COUNTER AND CONTINUE
U 11B1, 0000,003C,0180,0800,0000,11B2       ;3070           NOP
```

```
                                          ;3071          .PAGE   "TEST 8D       BEN EALU.Z TEST"
                                          ;3072   ;*******************************************************************
                                          ;3073   ;++
                                          ;3074   ; TEST  8D      BEN EALU.Z TEST
                                          ;3075   ;
                                          ;3076   ; TEST DESCRIPTION
                                          ;3077   ;       THIS IS A TEST OF THE BEN 12 BIT WHICH IS DETERMINED BY
                                          ;3078   ;       THE EALU Z BIT (EALU=0 AS STORED IN THE UCC).
                                          ;3079   ;
                                          ;3080   ; ERROR DESCRIPTION
                                          ;3081   ;       DATA PATTERN USED TO SET THE EALU UBCC
                                          ;3082   ;       ERROR CODE:
                                          ;3083   ;               0=> BEN FAILED TO BE ASSERTED
                                          ;3084   ;               1=> BEN FAILED TO BE DEASSERTED
                                          ;3085   ;
                                          ;3086   ;--
                                          ;3087   ;*******************************************************************
                                          ;3088   =0
U 11B2, 0000,003D,0180,0800,0000,108E     ;3089   EALUZ1: NEWTST
U 11B3, 0018,0038,0980,09F8,0000,1343     ;3090           RC[0F]_K[.2]
U 1343, 0018,0038,6180,0AA0,0000,1344     ;3091           R[4]_K[.F]              ; SET UP A COUNTER
U 1344, 0018,0038,8180,0AA8,0000,11B4     ;3092           R[5]_K[.3FF]            ; GET A MASK.
U 11B4, 0000,003D,0180,0800,0000,10FE     ;3093   =0      ERLOOP
U 11B5, 0000,003C,0180,0A20,0082,1345     ;3094   EALUZ2: SC_R[4]                 ; GENERATE THE TEST DATA.
U 1345, 0800,003C,0180,0A28,0000,1346     ;3095           D_R[5]                  ; SEE IF BRANCH WILL BE ASSERTED OR NOT.
U 1346, 0801,0024,0180,09F0,0082,1347     ;3096           A[U_D.ANDNOT.MASK,SC_ALU,RC[0E]_ALU,D_ALU
U 1347, 0001,003C,0180,0800,0010,1348     ;3097           ALU_D,CLK.UBCC
U 1348, 0000,013C,0180,0800,0000,11B6     ;3098           Z?
U 11B6, 0000,003C,0180,0800,0000,134A     ;3099   =0      J/EALUZ3
U 11B7, 0000,003C,0180,0800,0110,1349     ;3100           FE_SC,CLK.UBCC          ; TEST INSTRUCTION, LOAD THE UBCC
U 1349, 0003,123C,0180,09E8,0000,108B     ;3101           EA[U.Z?,RC[0D]_0        ; BRANCH BIT=EALU.Z=1
U 108B, 0000,003D,0180,0800,0000,1109     ;3102   =1011   ERROR1                  ; BRANCH FAILED, NOT ASSERTED.
U 108F, 0000,003C,0180,0800,0000,134C     ;3103           J/EALUZ4
U 134A, 0000,003C,0180,0800,0110,134B     ;3104   EALUZ3: FE_SC,CLK.UBCC          ; TEST INSTRUCTION, LOAD UBCC
U 134B, 0000,123C,0180,0800,0000,10AB     ;3105           EA[U.Z?                 ; BRANCH BIT=EALU.Z=0
U 10AB, 0000,003C,0180,0800,0000,134C     ;3106   =1011   J/EALUZ4
U 10AF, 0018,0039,0580,09E8,0000,1109     ;3107           ERROR1,RC[0D]_K[.1]     ; FAILED, BRANCH ASSERTED!
U 134C, 0000,003C,0180,0A20,0010,134D     ;3108   EALUZ4: ALU_R[4],CLK.UBCC       ; IF COUNTER IS NOT 0
U 134D, 0000,013C,0180,0800,0000,11B8     ;3109           Z?                      ; DECREMENT AND CONTINUE TEST
U 11B8, 0018,0000,0580,0AA0,0000,11B5     ;3110   =0      R[4]_LA-K[.1],J/EALUZ2
U 11B9, 0000,003C,0180,0800,0000,11BA     ;3111           NOP
```

```
                                        ;3112            .PAGE   "TEST 8E        BEN ALU<01:00> TEST"
                                        ;3113    ;*********************************************************************
                                        ;3114    ;++
                                        ;3115    ; TEST  8E      BEN ALU<01:00> TEST
                                        ;3116    ;
                                        ;3117    ; TEST DESCRIPTION
                                        ;3118    ;       THIS IS A TEST OF THE BEN 15 BITS WHICH ARE DEPENDENT
                                        ;3119    ;       UPON THE ALU OUTPUT OF THE PREVIOUS CYCLE IN BIT POSITIONS
                                        ;3120    ;       ALU<01:00>.
                                        ;3121    ;
                                        ;3122    ; ERROR DESCRIPTION
                                        ;3123    ;       LOW ORDER THREE BITS OF WHERE THE BRACH ACTUALLY WENT
                                        ;3124    ;       LOW ORDER THREE BITS OF WHERE THE BRANCH WAS EXPECTED TO GO
                                        ;3125    ;
                                        ;3126    ;--
                                        ;3127    ;*********************************************************************
                                        ;3128    =0
U 11BA, 0000,003D,0180,0800,0000,108E   ;3129    ALU01B: NEWTST
U 11BB, 0018,0038,0980,09F8,0000,11BC   ;3130            RC[0F]_K[.2]
                                        ;3131    ;///////////////7///////////////////////////////////////////////////
                                        ;3132    ;+
                                        ;3133    ;       SUBTEST 1
                                        ;3134    ;               ALU <01:00> =00
                                        ;3135    ;-
U 11BC, 0000,003D,0180,0800,0000,111E   ;3136    =0      SUBTEST
U 11BD, 0000,003C,0180,0800,0000,11BE   ;3137            NOP
U 11BE, 0000,003D,0180,0800,0000,10FE   ;3138    =0      ERLOOP
U 11BF, 0000,003C,0180,0800,0000,134E   ;3139            NOP
U 134E, 0818,0038,1180,0800,0000,134F   ;3140            D_K[.4]
U 134F, 0018,0038,0DC0,0800,0000,1350   ;3141            Q_K[.3]
U 1350, 0018,0038,1980,0800,0000,1008   ;3142            ALU_0(K)
U 1008, 0018,1539,1180,09E8,0000,1028   ;3143    =00     BEN7ALU1-0,CALL,J/BRT1,RC[0D]_K[.4]     ; ALU<01:00>=00
U 1009, 0001,203D,0180,09F0,0000,1109   ;3144            ERROR1,RC[0E]_Q
U 100A, 0000,003C,0180,0800,0000,11C0   ;3145            NOP
                                        ;3146    =
                                        ;3147    ;///////////////////////////////////////////////////////////////////
                                        ;3148    ;+
                                        ;3149    ;       SUBTEST 2
                                        ;3150    ;               ALU <01:00>=01
                                        ;3151    ;-
U 11C0, 0000,003D,0180,0800,0000,111E   ;3152    =0      SUBTEST
U 11C1, 0000,003C,0180,0800,0000,11C2   ;3153            NOP
U 11C2, 0000,003D,0180,0800,0000,10FE   ;3154    =0      ERLOOP
U 11C3, 0000,003C,0180,0800,0000,1351   ;3155            NOP
U 1351, 0818,0038,0580,0800,0000,1352   ;3156            D_K[.1]
U 1352, 0018,0038,D5C0,0800,0000,1353   ;3157            Q_K[.6]
U 1353, 0018,0038,0580,0800,0000,1040   ;3158            ALU_K[.1]
U 1040, 0018,1539,0580,09E8,0000,1028   ;3159    =00     BEN7ALU1-0,CALL,J/BRT1,RC[0D]_K[.1]     ; ALU<01:00>=01
U 1041, 0001,203D,0180,09F0,0000,1109   ;3160            ERROR1,RC[0E]_Q
U 1042, 0000,003C,0180,0800,0000,11C4   ;3161            NOP
                                        ;3162    =
                                        ;3163    ;///////////////////////////////////////////////////////////////////
                                        ;3164    ;+
                                        ;3165    ;       SUBTEST 3
                                        ;3166    ;               ALU <01:00>=10
```

```
                                          ;3167   ;-
U 11C4, 0000,003D,0180,0800,0000,111E     ;3168   =0      SUBTEST
U 11C5, 0000,003C,0180,0800,0000,11C6     ;3169           NOP
U 11C6, 0000,003D,0180,0800,0000,10FE     ;3170   =0      ERLOOP
U 11C7, 0018,0038,D5C0,0800,0000,1354     ;3171           Q_K[.6]
U 1354, 0019,2000,05C0,0800,0000,1355     ;3172           Q_Q-K[.1]
U 1355, 0818,0038,0980,0800,0000,1356     ;3173           D_K[.2]
U 1356, 0018,0038,0980,0800,0000,1048     ;3174           A[U_K[.2]
U 1048, 0018,1539,0980,09E8,0000,1028     ;3175   =00     BEN7ALU1-0,CALL,J/BRT1,RC[0D]_K[.2]      ; ALU<01:00>=10
U 1049, 0001,203D,0180,09F0,0000,1109     ;3176           ERROR1,RC[0E]_Q
U 104A, 0000,003C,0180,0800,0000,11C8     ;3177           NOP
                                          ;3178   =
                                          ;3179   ;//////////////////////////////////////////////////////////////////////
                                          ;3180   ;+
                                          ;3181   ;       SUBTEST 4
                                          ;3182   ;               ALU <01:00>=11
                                          ;3183   ;-
U 11C8, 0000,003D,0180,0800,0000,111E     ;3184   =0      SUBTEST
U 11C9, 0000,003C,0180,0800,0000,11CA     ;3185           NOP
U 11CA, 0000,003D,0180,0800,0000,10FE     ;3186   =0      ERLOOP
U 11CB, 0818,0038,0D80,0800,0000,1357     ;3187           D_K[.3]
U 1357, 0819,0014,0580,0800,0000,1358     ;3188           A[U_D+K[.1],D_ALU
U 1358, 0018,0038,11C0,0800,0000,1359     ;3189           Q_K[.4]
U 1359, 0018,0038,0D80,0800,0000,1050     ;3190           A[U_K[.3]
U 1050, 0018,1539,0D80,09E8,0000,1028     ;3191   =00     BEN7ALU1-0,CALL,J/BRT1,RC[0D]_K[.3]      ; ALU<01:00>=11
U 1051, 0001,203D,0180,09F0,0000,1109     ;3192           ERROR1,RC[0E]_Q
U 1052, 0000,003C,0180,0800,0000,11CC     ;3193           NOP
                                          ;3194   =
                                         ;3195          .PAGE   "TEST 8F        ILLEGAL FLOATING OPERAND UTRAP TEST"
                                         ;3196   ;*****************************************************************
                                         ;3197   ;++
                                         ;3198   ; TEST  8F      ILLEGAL FLOATING OPERAND TEST
                                         ;3199   ;
                                         ;3200   ; TEST DESCRIPTION
                                         ;3201   ;       THIS IS A TEST OF THE ILLEGAL FLOATING OPERAND DETECTION
                                         ;3202   ;       AND UTRAP LOGIC.
                                         ;3203   ;
                                         ;3204   ; ERROR DESCRIPTION
                                         ;3205   ;       DATA USED
                                         ;3206   ;
                                         ;3207   ;--
                                         ;3208   ;*****************************************************************
                                         ;3209   =0
U 11CC, 0000,003D,0180,0800,0000,108E    ;3210   ILFLOP: NEWTST
U 11CD, 0000,003C,6180,0800,0084,735A    ;3211          SC_K[.F]                ; GENERATE SOME CONSTANTS
U 135A, 0003,001C,0180,09F0,0000,135B    ;3212          ALU_NOT.MASK,RC[OE]_ALU
U 135B, 0003,001C,0180,0A98,0000,135C    ;3213          ALU_NOT.MASK,R[3]_ALU   ; R[3]=00008000
U 135C, 0000,003C,D980,0800,0084,735D    ;3214          SC_K[.9]
U 135D, 0003,001C,0180,0A90,0000,135E    ;3215          ALU_NOT.MASK,R[2]_ALU   ; R[2]=200
U 135E, 0018,0038,0580,09F8,0000,11CE    ;3216          RC[OF]_K[.1]
                                         ;3217   ;///////////////////////////////////////////////////////////////
                                         ;3218   ;+
                                         ;3219   ;      SUBTEST 1
                                         ;3220   ;              FLOATING OPERAND SHOULD TRAP
                                         ;3221   ;-
U 11CE, 0000,003D,0180,0800,0000,111E    ;3222   =0     SUBTEST
U 11CF, 0000,003C,0180,0800,0000,11D0    ;3223          NOP
U 11D0, 0000,003D,0180,0800,0000,10FE    ;3224   =0     ERLOOP
U 11D1, 0000,003C,0180,0A10,0000,135F    ;3225          LAB_R[2]
U 135F, 0000,003C,0180,0AF8,0000,1360    ;3226          R[OF]_LA                ; SET UTRAP FLAG FOR ILLEGAL FLOATING OPEREAND
U 1360, 0000,003C,0180,0A18,0800,1361    ;3227          ALU_R[3],MSC/CHK.FLT.OPR ; SHOULD TRAP HERE WITH ALU=00008000.
U 1361, 0000,003C,0180,0A78,0010,1362    ;3228          ALU_R[OF],CLK.UBCC      ; DID A UTRAP OCCUR?
U 1362, 0000,013C,0180,0800,0000,11D2    ;3229          Z?
U 11D2, 0000,003D,0180,0800,0000,1109    ;3230   =0     ERROR1                  ; NO UTRAP WITH ALU=00008000
U 11D3, 0000,003C,0180,0800,0000,11D4    ;3231          NOP
                                         ;3232   ;///////////////////////////////////////////////////////////////
                                         ;3233   ;+
                                         ;3234   ;      SUBTEST 2
                                         ;3235   ;              ALU = 0, NO UTRAP SHOULD OCCUR
                                         ;3236   ;-
U 11D4, 0000,003D,0180,0800,0000,111E    ;3237   =0     SUBTEST
U 11D5, 0000,003C,0180,0800,0000,11D6    ;3238          NOP
U 11D6, 0000,003D,0180,0800,0000,10FE    ;3239   =0     ERLOOP
U 11D7, 0000,003C,0180,0A10,0000,1363    ;3240          LAB_R[2]
U 1363, 0000,003C,0180,0AF8,0000,1364    ;3241          R[OF]_LA                ; SET THE ILLEGAL FLOATING OPERAND UTRAP FLAG
U 1364, 0018,0038,1980,09F0,0800,1365    ;3242          ALU_0(K),RC[OE]_ALU,MSC/CHK.FLT.OPR ; SHOULD NOT TRAP WITH ALU=0
U 1365, 0000,003C,0180,0A78,0010,1366    ;3243          ALU_R[OF],CLK.UBCC      ; DID A UTRAP OCCUR
U 1366, 0000,013C,0180,0800,0000,11D8    ;3244          Z?
U 11D8, 0000,003C,0180,0800,0000,1367    ;3245   =0     J/FLOP2
U 11D9, 0000,003D,0180,0800,0000,1109    ;3246          ERROR1                  ; AN ILLEGAL FLOATING OPERAND UTRAP
                                         ;3247                                  ; OCCURRED WITH ALU=0
                                         ;3248   ;///////////////////////////////////////////////////////////////
                                         ;3249   ;+
                                          ;3250   ;       SUBTEST 3
                                          ;3251   ; NOW PERFORM TEST WITH ALU DATA EQUAL TO A PATTERN OF A 1 FLOATING
                                          ;3252   ; ACROSS ALU<14:07> AND ALU<15>=1. THIS IS A CONDITION WHICH
                                          ;3253   ; SHOULD NOT UTRAP.
                                          ;3254   ;-
U 11DA, 0000,003D,0180,0800,0000,111E     ;3255   =0      SUBTEST
U 11DB, 0000,003C,0180,0800,0000,1367     ;3256           NOP
U 1367, 0018,0038,0580,09F8,0000,1368     ;3257   FLOP2:  RC[0F]_K[.1]
U 1368, 0018,0038,5D80,0A88,0000,11DC     ;3258           R[1]_K[.7]                ; INITIALIZE A COUNTER USED TO
                                          ;3259                                     ; GENERATE THE TEST DATA.
U 11DC, 0000,003D,0180,0800,0000,10FE     ;3260   =0      ERLOOP
U 11DD, 0000,003C,01C0,0A08,0000,1369     ;3261   FLOP3:  Q_R[1]                    ; GENERATE THE TEST DATA.
U 1369, 0818,0038,5D80,0800,0000,136A     ;3262           D_K[.7]
U 136A, 001D,2014,0180,0800,0082,136B     ;3263           ALU_Q[A+B]D,SC_ALU
U 136B, 0800,003C,0180,0A18,0000,136C     ;3264           D_R[3]
U 136C, 0801,0024,018C,09F0,0000,136D     ;3265           ALU_D.ANDNOT.MASK,RC[0E]_ALU,D_ALU
U 136D, 0000,003C,0180,0A10,0000,136E     ;3266           LAB_R[2]
U 136E, 0000,003C,0180,0AF8,0000,136F     ;3267           R[0F]_LA                  ; SET THE ILLEGAL FLOATING OPERAND UTRAP FLAG.
U 136F, 0001,003C,0180,0800,0800,1370     ;3268           ALU_D,MSC/CHK.FLT.OPR     ; SHOULD NOT TRAP
U 1370, 0000,003C,0180,0A78,0010,1371     ;3269           ALU_R[0F],CLK.UBCC        ; SEE IF A UTRAP OCCURRED.
U 1371, 0000,013C,0180,0800,0000,11DE     ;3270           Z?
U 11DE, 0000,003C,0180,0800,0000,1372     ;3271   =0      J/FLOP4
U 11DF, 0000,003D,0180,0800,0000,1109     ;3272           ERROR1                    ; AN ILLEGAL FLOATING OPERAND
                                          ;3273                                     ; UTRAP OCCURRED WITH THE ALU
                                          ;3274                                     ; OUTPUT NOT EQUAL TO AN ILLEGAL
                                          ;3275                                     ; FLOATING OPERAND.
U 1372, 0000,003C,0180,0A08,0010,1373     ;3276   FLOP4:  ALU_R[1],CLK.UBCC         ; TRIED ALL TEST DATA PATTERNS?
U 1373, 0000,013C,0180,0800,0000,11E0     ;3277           Z?
U 11E0, 0018,0000,0580,0A88,0000,11DD     ;3278   =0      R[1]_LA-K[.1],J/FLOP3     ; IF NOT CONTINUE
U 11E1, 0000,003C,0180,0800,0000,11E2     ;3279           NOP
                                          ;3280   =0
U 11E2, 0000,003D,0180,0800,0000,108E     ;3281   DUMMY1: NEWTST
```

```
;                            Location / Line Number Index

;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000           1871:    1838     1845=    1861=    1862=    1863=    1839     2738=
U 1008           3143=    3144=    3145=    1840     2000=    2001=    1841     2740=
U 1010           1952=    1953=    1954=    1955=    1956=    1957=    1958=    1959=
U 1018           1960=    1961=    1962=    1963=    1964=    1965=    1966=    1967=
U 1020           1983=    1984=    1985=    1986=    1987=    1988=    1989=    1990=
U 1028           1991=    1992=    1993=    1994=    1995=    1996=    1997=    1998=
U 1030           2064=    2065=    2066=    2067=    2068=    2069=    2070=    2071=
U 1038           2072=    2073=    2074=    2075=    2076=    2077=    2078=    2079=
U 1040           3159=    3160=    3161=    1842     2024=    2025=    1843     2748=
U 1048           3175=    3176=    3177=    1844     2032=    2033=    1902:    2749=
U 1050           3191=    3192=    3193=    1864     2038=    2039=    1865     2757=
U 1058           2040=    2041=    1905:    1866     2042=    2043=    1908:    2759=
U 1060           2143=    2144=    2145=    2146=    2147=    2148=    2149=    2150=
U 1068           2151=    2152=    2153=    2154=    2155=    2156=    2157=    2158=
U 1070           2213=    2214=    2215=    2216=    2217=    2218=    1867     2766=
U 1078           2049=    2050=    2052=    2053=    2056=    2057=    1868     2767=
U 1080           2273=    2274=    2275=    2276=    2277=    2278=    2279=    2280=
U 1088           2281=    1869     1870     3102=    2059=    2060=    1880     3103=
U 1090           2346=    2347=    2348=    2349=    2350=    1881     1882     2775=
U 1098           2103=    2104=    2111=    2112=    2117=    2118=    1883     2777=
U 10A0           2416=    2417=    2418=    2419=    2420=    2421=    2422=    2423=
U 10A8           2119=    2120=    1884     3106=    2122=    2123=    1885     3107=
U 10B0           2128=    2129=    2132=    2133=    2135=    2136=    1886     2780=
U 10B8           2138=    2139=    2186=    2187=    2189=    2190=    1887     2781=
U 10C0           2198=    2199=    2202=    2203=    2205=    2206=    1888     3062=
U 10C8           2208=    2209=    2249=    2250=    2251=    2252=    1889     3063=
U 10D0           2260=    2261=    2264=    2266=    2268=    2269=    1890     3066=
U 10D8           2310=    2311=    2312=    2313=    2319=    2320=    1891     3067=
U 10E0           2326=    2329=    1892     2195=    2331=    2334=    1893     2196=
U 10E8           2339=    2340=    1894     2257=    2381=    2382=    1895     2258=
U 10F0           2383=    2384=    1896     2316=    2390=    2391=    1897     2317=
U 10F8           2395=    2396=    1898     2335=    2401=    2404=    1899     2336=
U 1100           1825:    1826:    1827:    1828:    1829:    1830:    1831:    1832:
U 1108           1833:    1900     2409=    2410=    1834:    1835:    1836:    1837:
U 1110           2442=    2443=    1901     2387=    2445=    2446=    1903     2388=
U 1118           2454=    2455=    1904     2405=    2462=    2463=    1936     2406=
U 1120           2465=    2466=    2483=    2484=    2486=    2487=    2495=    2496=
U 1128           2503=    2504=    2506=    2507=    2524=    2525=    2527=    2528=
U 1130           2536=    2537=    2544=    2545=    2547=    2548=    2565=    2566=
U 1138           2568=    2569=    2577=    2578=    2585=    2586=    2588=    2589=
U 1140           2606=    2607=    2609=    2610=    2618=    2619=    2626=    2627=
U 1148           2629=    2630=    2646=    2647=    2649=    2650=    2658=    2659=
U 1150           2666=    2667=    2669=    2670=    1937     1928:    2687=    2688=
U 1158           2693=    2694=    2703=    2704=    2712=    2713=    2715=    2716=
U 1160           2733=    2734=    2741=    2742=    2753=    2754=    2760=    2761=
U 1168           2771=    2772=    2809=    2810=    2814=    2815=    2817=    2818=
U 1170           2819=    2820=    2821=    2822=    2834=    2835=    2841=    2842=
U 1178           2847=    2850=    2855=    2856=    2860=    2861=    2866=    2867=
U 1180           2871=    2876=    2883=    2884=    2888=    2889=    2893=    2894=
U 1188           2906=    2907=    2911=    2912=    2916=    2917=    2929=    2930=
U 1190           2934=    2935=    2939=    2940=    2952=    2953=    2957=    2958=
U 1198           2962=    2964=    2968=    2975=    2988=    2989=    2993=    2997=
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0           2999=   3000=   3004=   3005=   3017=   3018=   3020=   3021=
U 11A8           3025=   3026=   3047=   3048=   3052=   3053=   3059=   3060=
U 11B0           3069=   3070=   3089=   3090=   3093=   3094=   3099=   3100=
U 11B8           3110=   3111=   3129=   3130=   3136=   3137=   3138=   3139=
U 11C0           3152=   3153=   3154=   3155=   3168=   3169=   3170=   3171=
U 11C8           3184=   3185=   3186=   3187=   3210=   3211=   3222=   3223=
U 11D0           3224=   3225=   3230=   3231=   3237=   3238=   3239=   3240=
U 11D8           3245=   3246=   3255=   3256=   3260=   3261=   3271=   3272=
U 11E0           3278=   3279=   3281=   1943    1944    1945    1947    1948
U 11E8           1949    1950    1968    1969    1970    1971    1972    1973
U 11F0           1974    1975    1976    1977    1999    2026    2027    2028
U 11F8           2029    2030    2031    2034    2035    2036    2037    2044
U 1200           2045    2046    2047    2048    2051    2054    2055    2058
U 1208           2061    2080    2105    2106    2107    2108    2109    2110
U 1210           2113    2114    2115    2116    2121    2124    2125    2126
U 1218           2127    2130    2131    2134    2137    2140    2159    2188
U 1220           2191    2192    2193    2194    2197    2200    2201    2204
U 1228           2207    2220    2253    2254    2255    2256    2259    2262
U 1230           2263    2267    2283    2314    2315    2318    2321    2322
U 1238           2323    2324    2325    2330    2337    2338    2352    2385
U 1240           2386    2389    2392    2393    2394    2397    2398    2399
U 1248           2400    2407    2408    2425    2444    2447    2448    2449
U 1250           2450    2451    2452    2453    2456    2457    2458    2459
U 1258           2460    2461    2464    2485    2488    2489    2490    2491
U 1260           2492    2493    2494    2497    2498    2499    2500    2501
U 1268           2502    2505    2526    2529    2530    2531    2532    2533
U 1270           2534    2535    2538    2539    2540    2541    2542    2543
U 1278           2546    2567    2570    2571    2572    2573    2574    2575
U 1280           2576    2579    2580    2581    2582    2583    2584    2587
U 1288           2608    2611    2612    2613    2614    2615    2616    2617
U 1290           2620    2621    2622    2623    2624    2625    2628    2648
U 1298           2651    2652    2653    2654    2655    2656    2657    2660
U 12A0           2661    2662    2663    2664    2665    2668    2689    2690
U 12A8           2691    2692    1929:   2695    2696    2697    2698    2699
U 12B0           2700    2701    2702    2705    2706    2707    2708    2709
U 12B8           2710    2711    2714    2735    2736    2737    2743    2744
U 12C0           2745    2746    2747    2751    2752    2755    2756    2762
U 12C8           2763    2764    2765    2769    2770    2773    2774    2778
U 12D0           2779    2811    2812    2813    2823    2824    2825    2826
U 12D8           2827    2828    2833    2836    2837    2838    2839    2840
U 12E0           2843    2844    2846    2852    2853    2854    2857    2858
U 12E8           2859    2863    2864    2865    2868    2869    2870    2877
U 12F0           2878    2879    2880    2881    2882    2885    2886    2887
U 12F8           2890    2891    2892    2899    2900    2901    2902    2903
U 1300           2904    2905    2908    2909    2910    2913    2914    2915
U 1308           2922    2923    2924    2925    2926    2927    2928    2931
U 1310           2932    2933    2936    2937    2938    2945    2946    2947
U 1318           2948    2949    2950    2951    2954    2955    2956    2959
U 1320           2960    2961    2965    2966    2967    2983    2984    2985
U 1328           2986    2987    2990    2991    2992    2998    3001    3002
U 1330           3003    3019    3022    3023    3024    3027    3028    3049
U 1338           3050    3051    3054    3055    3056    3057    3058    3061
U 1340           3064    3065    3068    3091    3092    3095    3096    3097
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348           3098    3101    3104    3105    3108    3109    3140    3141
U 1350           3142    3156    3157    3158    3172    3173    3174    3188
U 1358           3189    3190    3212    3213    3214    3215    3216    3226
U 1360           3227    3228    3229    3241    3242    3243    3244    3257
U 1368           3258    3262    3263    3264    3265    3266    3267    3268
U 1370           3269    3270    3276    3277
U 1378 - 13EF Unused
U 13F0           1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8           1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH25        900

Used             900
Remaining

Total microwords used in memory U: 900
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH25.MIC

Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 1806  MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2138  TEST 90 BEN STATE<03:00> TEST
; 2169  TEST 91 BEN STATE<07:04> TEST
; 2205  TEST 92 BEN SS (SIGN SOURCE) TEST
; 2231  TEST 93 BEN LA<01:00> TEST
; 2283  TEST 94 BEN D<01:00> (BEN/0C) TEST
; 2333  TEST 95 BEN/0F TEST 1
; 2398  TEST 96 BEN/0F TEST 2
; 2461  TEST 97 BEN PTE VALID TEST
; 2515  TEST 98 BEN PSL<27>, FPD, TEST
; 2556  TEST 99 BEN/1C TEST
; 2597  TEST 9A NESTED ERROR BIT, BEN/NEST.ERR AND CES<NEST.ERR> TEST
; 2670  TEST 9B BEN PSL.CC TEST
; 2717  TEST 9C BEN/1C, CONSOLE MODE, TEST
; 2752  TEST 9D BEN/1C, KERNAL MODE, TEST
; 2793  TEST 9E BRANCH ENABLE 3 -- ALU C BIT
; 2848  TEST 9F BRANCH ENABLE 1B -- ALU Z BIT
; 2897  TEST A0 ID BUS ADDRESSED BY THE SC
```

```
;1          .NOLIST
;1804       .LIST
;1805
```

```
                                        .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                .REGION/1000,13FF
                                ;+
                                ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                ;
                                ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                ;       R[OF] AND DO A RETURN0.
                                ;
                                ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                ; TO THE CONSOLE.
                                ;
                                ;-
U 1100, 0000,003C,1980,0800,0084,7005   1100:   SC_K[ZERO],J/TRPH1      ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001   1101:   SC_K[.1],J/TRPH0        ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001   1102:   SC_K[.2],J/TRPH0        ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001   1103:   SC_K[.3],J/TRPH0        ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001   1104:   SC_K[.4],J/TRPH0        ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001   1105:   SC_K[.6],J/TRPH0        ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001   1106:   SC_K[.9],J/TRPH0        ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001   1107:   SC_K[.7],J/TRPH0        ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001   1108:   SC_K[.8],J/TRPH0        ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7005   110C:   SC_K[.C],J/TRPH1        ; RDS
U 110D, 0000,003C,8980,0800,0084,7005   110D:   SC_K[.D],J/TRPH1        ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001   110E:   SC_K[.10],J/TRPH0       ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7005   110F:   SC_K[.F],J/TRPH1        ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,102E   TRPH0:  Q_ID[USTACK]
U 102E, 0C00,003C,01E0,0800,0000,103B           Q_D,D_Q
U 103B, 0000,003C,8180,3C00,0000,103E           ID[USTACK]_D
U 103E, 0C00,003C,01E0,0800,0000,105B           Q_D,D_Q
U 105B, 0000,003C,01C0,0A78,0000,107C           Q_R[OF]
U 107C, 0001,2024,0180,0800,0010,107E           ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 107E, 0000,013C,0180,0800,0000,1004           Z?                              ; BRANCH IF NO
U 1004, 0001,2036,0180,0AF8,0000,0000   =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
                                ;+
                                ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                ;
                                ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                ;             FAULT STATUS REGISTER
                                ;             SBI ERROR REGISTER
                                ;             TIMEOUT ADDRESS REGISTER
                                ;             MAINTENANCE REGISTER
                                ;             CACHE PARITY REGISTER
                                ;             TB ERROR REGISTER 1
                                ;             TB ERROR REGISTER 0
                                ;-
```

```
U 1005, 0018,0038,1D80,09E8,0000,100C   ;1861   TRPH1:  RC[0D]_SC
U 100C, 0000,003D,D980,0800,0084,7196   ;1862   =0      SETRCF[.9]
U 100D, 0000,003C,49F0,2C00,0000,109C   ;1863           Q_ID[TBER0]
U 109C, 0001,203C,4DF0,2DB0,0000,109E   ;1864           RC[6]_Q,Q_ID[TBER1]
U 109E, 0001,203C,65F0,2DB8,0000,10B0   ;1865           RC[7]_Q,Q_ID[SBI.ERR]
U 10B0, 0001,203C,6DF0,2DD8,0000,10B2   ;1866           RC[0B]_Q,Q_ID[FAULT]
U 10B2, 0001,203C,75F0,2DE0,0000,10B4   ;1867           RC[0C]_Q,Q_ID[MAINT]
U 10B4, 0001,203C,79F0,2DC8,0000,10B6   ;1868           RC[9]_Q,Q_ID[PARITY]
U 10B6, 0001,203C,69F0,2DC0,0000,10BC   ;1869           RC[8]_Q,Q_ID[TIME.ADDR]
U 10BC, 0001,203C,81F0,2DD0,0000,1000   ;1870           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,116E   ;1871   1000:   RC[0E]_Q,ERROR1
                                        ;1872   ;+
                                        ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1875   ;               NEWTST
                                        ;1876   ;               ERLOOP
                                        ;1877   ;               ERROR1
                                        ;1878   ;               ERROR2
                                        ;1879   ;
U 10BE, 0000,003C,65F8,0800,0084,70D0   ;1880   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 10D0, 0818,0038,8D80,0800,0000,10D2   ;1881           D_K[.1F]                        ; ...
U 10D2, 0D00,003C,0180,0800,0000,10D4   ;1882           D_DAL.SC
U 10D4, 0000,003C,3D80,3C00,0000,10D6   ;1883           ID[PSL]_D                       ; WRITE THE PSL
U 10D6, 0818,0038,0580,0800,0000,10DA   ;1884           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 10DA, 0D00,003C,0180,0800,0000,10DE   ;1885           D_DAL.SC
U 10DE, 0F00,003C,3180,3C00,0000,10F0   ;1886           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 10F0, 0000,003C,5D80,3C00,0000,10F2   ;1887           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 10F2, 0000,003C,3980,3C00,0000,10F4   ;1888           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 10F4, 0000,003C,2980,3C00,0000,10F6   ;1889           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 10F6, 0000,003C,4980,3C00,0000,10FA   ;1890           ID[TBER0]_D                     ; SHUT OFF THE TB
U 10FA, 0818,0038,C180,0800,0000,10FE   ;1891           D_K[.FFFF]
U 10FE, 0000,003C,6580,3C00,0000,1109   ;1892           ID[SBI.ERR]_D
U 1109, 0F00,003C,6D80,3C00,0000,111A   ;1893           ID[FAULT]_D,D_0
U 111A, 0000,003C,6D80,3C00,0000,111E   ;1894           ID[FAULT]_D
U 111E, 0000,003C,6580,3C00,0000,1146   ;1895           ID[SBI.ERR]_D
U 1146, 0003,003C,0180,09F0,0000,114E   ;1896           RC[0E]_0
U 114E, 0003,003C,0180,0AF8,0000,1154   ;1897           R[0F]_0
U 1154, 0003,003C,0180,09E8,0000,105E   ;1898           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 1166, 0818,0038,0980,0800,0000,105E   ;1899   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 116E, 0810,0038,0180,0978,0000,1174   ;1900   ERROR1: D_RC[0F]
U 1174, 0819,0034,4D80,0800,0000,104E   ;1901           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1902   104E:   D_D.OR.K[.4],J/CALLCON
U 1176, 0810,0038,0180,0978,0000,1186   ;1903   ERROR2: D_RC[0F]
U 1186, 0819,0034,4D80,0800,0000,105A   ;1904           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1905   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1906   105E:
                                        ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1908           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1909   ;+
                                        ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1912   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1913   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1914   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1915   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,118E   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 118E, 0810,0038,4D80,0978,0000,1194   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 1194, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 1196, 0010,0038,01C0,0978,0000,119A   ;1943   SETRCF: Q_RC[OF]
U 119A, 0019,2034,4DC0,0800,0000,119E   ;1944           Q_Q.AND.K[.FF00]
U 119E, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 11AA, 0118,0038,1B80,0800,0000,11BE   ;1947   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 11AE, 0118,0038,0B80,0800,0000,11BE   ;1948   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 11B5, 0118,0038,0780,0800,0000,11BE   ;1949   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 11BA, 0118,0038,C380,0800,0000,11BE   ;1950   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
                                        ;1951   =0000
U 1060, 0018,0038,1980,0800,0000,11AA   ;1952   DC0:    ALU_0(K),J/S00
U 1061, 0018,0038,1980,0800,0000,11AE   ;1953   DC1:    ALU_0(K),J/S01
U 1062, 0018,0038,1980,0800,0000,11B5   ;1954   DC2:    ALU_0(K),J/S10
U 1063, 0018,0038,1980,0800,0000,11BA   ;1955   DC3:    ALU_0(K),J/S11
U 1064, 0018,0038,0980,0800,0000,11AA   ;1956   DC4:    ALU_K[.2],J/S00
U 1065, 0018,0038,0980,0800,0000,11AE   ;1957   DC5:    ALU_K[.2],J/S01
U 1066, 0018,0038,0980,0800,0000,11B5   ;1958   DC6:    ALU_K[.2],J/S10
U 1067, 0018,0038,0980,0800,0000,11BA   ;1959   DC7:    ALU_K[.2],J/S11
U 1068, 0018,0038,0580,0800,0000,11AA   ;1960   DC8:    ALU_K[.1],J/S00
U 1069, 0018,0038,0580,0800,0000,11AE   ;1961   DC9:    ALU_K[.1],J/S01
U 106A, 0018,0038,0580,0800,0000,11B5   ;1962   DCA:    ALU_K[.1],J/S10
U 106B, 0018,0038,0580,0800,0000,11BA   ;1963   DCB:    ALU_K[.1],J/S11
U 106C, 0018,0038,C180,0800,0000,11AA   ;1964   DCC:    ALU_K[.FFFF],J/S00
U 106D, 0018,0038,C180,0800,0000,11AE   ;1965   DCD:    ALU_K[.FFFF],J/S01
U 106E, 0018,0038,C180,0800,0000,11B5   ;1966   DCE:    ALU_K[.FFFF],J/S10
U 106F, 0018,0038,C180,0800,0000,11BA   ;1967   DCF:    ALU_K[.FFFF],J/S11
U 11BE, 0100,003E,0380,0800,0000,0001   ;1968   SX:     D_D.LEFT2,SI/7,RETURN1
U 11C2, 0018,0038,01C0,0800,0000,1010   ;1969   DC.6:   Q_K[.8]
                                        ;1970   =0
```

```
U 1010, 0000,003D,0180,0800,0000,1066    ;1971   DC.6A:  CALL,J/DC6
U 1011, 0019,2000,05C0,0800,0010,11C6    ;1972           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 11C6, 0000,013C,0180,0800,0000,1014    ;1973           Z?
U 1014, 0000,003C,0180,0800,0000,1010    ;1974   =0      J/DC.6A
U 1015, 0000,003E,0180,0800,0000,0001    ;1975           RETURN1
U 11CA, 0018,0038,0580,0800,0000,11CE    ;1976   DCAAAA: ALU_K[.1]
U 11CE, 0118,0038,0780,0800,0000,1212    ;1977           ALU_K[.1],D_D.LEFT2,SI/7
U 1212, 0118,0038,0780,0800,0000,1213    ;1978           ALU_K[.1],D_D.LEFT2,SI/7
U 1213, 0118,0038,0780,0800,0000,1214    ;1979           ALU_K[.1],D_D.LEFT2,SI/7
U 1214, 0118,0038,0780,0800,0000,1215    ;1980           ALU_K[.1],D_D.LEFT2,SI/7
U 1215, 0118,0038,0780,0800,0000,1216    ;1981           ALU_K[.1],D_D.LEFT2,SI/7
U 1216, 0118,0038,0780,0800,0000,1217    ;1982           ALU_K[.1],D_D.LEFT2,SI/7
U 1217, 0118,0038,0780,0800,0000,1218    ;1983           ALU_K[.1],D_D.LEFT2,SI/7
U 1218, 0100,003E,0380,0800,0000,0001    ;1984           D_D.LEFT2,SI/7,RETURN1
U 1219, 0018,0038,0980,0800,0000,121A    ;1985   DRAAAA: ALU_K[.2]
U 121A, 0218,0038,0B80,0800,0000,121B    ;1986           ALU_K[.2],D_D.RIGHT2,SI/7
U 121B, 0218,0038,0B80,0800,0000,121C    ;1987           ALU_K[.2],D_D.RIGHT2,SI/7
U 121C, 0218,0038,0B80,0800,0000,121D    ;1988           ALU_K[.2],D_D.RIGHT2,SI/7
U 121D, 0218,0038,0B80,0800,0000,121E    ;1989           ALU_K[.2],D_D.RIGHT2,SI/7
U 121E, 0218,0038,0B80,0800,0000,121F    ;1990           ALU_K[.2],D_D.RIGHT2,SI/7
U 121F, 0218,0038,0B80,0800,0000,1220    ;1991           ALU_K[.2],D_D.RIGHT2,SI/7
U 1220, 0218,0038,0B80,0800,0000,1221    ;1992           ALU_K[.2],D_D.RIGHT2,SI/7
U 1221, 0200,003E,0380,0800,0000,0001    ;1993           D_D.RIGHT2,SI/7,RETURN1
U 1222, 0F00,003C,0180,0800,0000,1223    ;1994   DC.NF:  D_0
U 1223, 0819,0000,0580,0800,0000,1060    ;1995           D_D-K[.1],J/DC0
                                         ;1996   ; THIS TABLE IS ISED AS A TARGET TO TEST  BRANCHES.
                                         ;1997   ; NOTE THAT IT RETURNS BY RETURN2 IF Q IS
                                         ;1998   ; ZERO AFTER EXECUTION, OR RETURNS BY RETURN1 IF Q IS NON ZERO.
                                         ;1999   =0000
U 1080, 0019,2000,05C0,0800,0000,1081    ;2000   BRTBLE: Q_Q-K[.1]
U 1081, 0019,2000,05C0,0800,0000,1082    ;2001           Q_Q-K[.1]
U 1082, 0019,2000,05C0,0800,0000,1083    ;2002           Q_Q-K[.1]
U 1083, 0019,2000,05C0,0800,0000,1084    ;2003           Q_Q-K[.1]
U 1084, 0019,2000,05C0,0800,0000,1085    ;2004           Q_Q-K[.1]
U 1085, 0019,2000,05C0,0800,0000,1086    ;2005           Q_Q-K[.1]
U 1086, 0019,2000,05C0,0800,0000,1087    ;2006           Q_Q-K[.1]
U 1087, 0019,2000,05C0,0800,0000,1088    ;2007           Q_Q-K[.1]
U 1088, 0019,2000,05C0,0800,0000,1089    ;2008   BRT1:   Q_Q-K[.1]
U 1089, 0019,2000,05C0,0800,0000,108A    ;2009           Q_Q-K[.1]
U 108A, 0019,2000,05C0,0800,0000,108B    ;2010           Q_Q-K[.1]
U 108B, 0019,2000,05C0,0800,0000,108C    ;2011           Q_Q-K[.1]
U 108C, 0019,2000,05C0,0800,0000,108D    ;2012   BRT2:   Q_Q-K[.1]
U 108D, 0019,2000,05C0,0800,0000,108E    ;2013           Q_Q-K[.1]
U 108E, 0019,2000,05C0,0800,0000,108F    ;2014           Q_Q-K[.1]
U 108F, 0001,203C,0180,0800,0010,1224    ;2015           ALU_Q,CLK.UBCC
U 1224, 001D,2114,01C0,0800,0000,101C    ;2016           Z?,ALU_Q+D,Q_ALU
U 101C, 0000,003E,0180,0800,0000,0001    ;2017   =0      RETURN1
U 101D, 0000,003E,0180,0800,0000,0002    ;2018           RETURN2
                                         ;2019   ; THESE SUBROUTINES ARE USED TO SHIFT ZEROES INTO THE Q REGISTER.
                                         ;2020   =0
U 1020, 0000,003D,0180,0800,0000,1225    ;2021   SHQLFT16:       CALL,J/SHQLFT8
U 1021, 0000,003C,0180,0800,0000,1225    ;2022           J/SHQLFT8
U 1225, 0000,003C,01A8,0800,0000,1226    ;2023   SHQLFT8:        Q_Q.LEFT,SI/3
U 1226, 0000,003C,01A8,0800,0000,1227    ;2024   SHQLFT7:        Q_Q.LEFT,SI/3
U 1227, 0000,003C,01A8,0800,0000,1228    ;2025           Q_Q.LEFT,SI/3
```

```
U 1228, 0000,003C,01A8,0800,0000,1229   ;2026            Q_Q.LEFT,SI/3
U 1229, 0000,003C,01A8,0800,0000,122A   ;2027            Q_Q.LEFT,SI/3
U 122A, 0000,003C,01A8,0800,0000,122B   ;2028            Q_Q.LEFT,SI/3
U 122B, 0000,003C,01A8,0800,0000,122C   ;2029            Q_Q.LEFT,SI/3
U 122C, 0000,003E,01A8,0800,0000,0001   ;2030            Q_Q.LEFT,SI/3,RETURN1
                                        ;2031   ; THESE SUBROUTINES ARE USED TO SHIFT 1'S INTO THE Q REGISTE.
                                        ;2032   =0
U 1024, 0000,003D,0180,0800,0000,122D   ;2033   SHQL16: CALL,J/SHQL8
U 1025, 0000,003C,0180,0800,0000,122D   ;2034            J/SHQL8
U 122D, 0000,003C,03A8,0800,0000,122E   ;2035   SHQL8:   Q_Q.LEFT,SI/7
U 122E, 0000,003C,03A8,0800,0000,122F   ;2036   SHQL7:   Q_Q.LEFT,SI/7
U 122F, 0000,003C,03A8,0800,0000,1230   ;2037            Q_Q.LEFT,SI/7
U 1230, 0000,003C,03A8,0800,0000,1231   ;2038            Q_Q.LEFT,SI/7
U 1231, 0000,003C,03A8,0800,0000,1232   ;2039            Q_Q.LEFT,SI/7
U 1232, 0000,003C,03A8,0800,0000,1233   ;2040            Q_Q.LEFT,SI/7
U 1233, 0000,003C,03A8,0800,0000,1234   ;2041            Q_Q.LEFT,SI/7
U 1234, 0000,003E,03A8,0800,0000,0001   ;2042            Q_Q.LEFT,SI/7,RETURN1
                                        ;2043   ; THESE TABLES ARE USED TO WRITE THE RA AND RB SCRATCH PADS.
                                        ;2044   =0000
U 10A0, 0001,203E,0180,0A80,0000,0001   ;2045   WRRARB: R[0]_Q,RETURN1
U 10A1, 0001,203E,0180,0A88,0000,0001   ;2046            R[1]_Q,RETURN1
U 10A2, 0001,203E,0180,0A90,0000,0001   ;2047            R[2]_Q,RETURN1
U 10A3, 0001,203E,0180,0A98,0000,0001   ;2048            R[3]_Q,RETURN1
U 10A4, 0001,203E,0180,0AA0,0000,0001   ;2049            R[4]_Q,RETURN1
U 10A5, 0001,203E,0180,0AA8,0000,0001   ;2050            R[5]_Q,RETURN1
U 10A6, 0001,203E,0180,0AB0,0000,0001   ;2051            R[6]_Q,RETURN1
U 10A7, 0001,203E,0180,0AB8,0000,0001   ;2052            R[7]_Q,RETURN1
U 10A8, 0001,203E,0180,0AC0,0000,0001   ;2053            R[8]_Q,RETURN1
U 10A9, 0001,203E,0180,0AC8,0000,0001   ;2054            R[9]_Q,RETURN1
U 10AA, 0001,203E,0180,0AD0,0000,0001   ;2055            R[0A]_Q,RETURN1
U 10AB, 0001,203E,0180,0AD8,0000,0001   ;2056            R[0B]_Q,RETURN1
U 10AC, 0001,203E,0180,0AE0,0000,0001   ;2057            R[0C]_Q,RETURN1
U 10AD, 0001,203E,0180,0AE8,0000,0001   ;2058            R[0D]_Q,RETURN1
U 10AE, 0001,203E,0180,0AF0,0000,0001   ;2059            R[0E]_Q,RETURN1
U 10AF, 0001,203E,0180,0AF8,0000,0001   ;2060            R[0F]_Q,RETURN1
                                        ;2061   ; THESE TABLES ARE USED TO WRITE Q INTO THE RC SCRATCH PADS.
                                        ;2062   =0000
U 10C0, 0001,203E,0180,0980,0000,0001   ;2063   WRRC:    RC[0]_Q,RETURN1
U 10C1, 0001,203E,0180,0988,0000,0001   ;2064            RC[1]_Q,RETURN1
U 10C2, 0001,203E,0180,0990,0000,0001   ;2065            RC[2]_Q,RETURN1
U 10C3, 0001,203E,0180,0998,0000,0001   ;2066            RC[3]_Q,RETURN1
U 10C4, 0001,203E,0180,09A0,0000,0001   ;2067            RC[4]_Q,RETURN1
U 10C5, 0001,203E,0180,09A8,0000,0001   ;2068            RC[5]_Q,RETURN1
U 10C6, 0001,203E,0180,09B0,0000,0001   ;2069            RC[6]_Q,RETURN1
U 10C7, 0001,203E,0180,09B8,0000,0001   ;2070            RC[7]_Q,RETURN1
U 10C8, 0001,203E,0180,09C0,0000,0001   ;2071            RC[8]_Q,RETURN1
U 10C9, 0001,203E,0180,09C8,0000,0001   ;2072            RC[9]_Q,RETURN1
U 10CA, 0001,203E,0180,09D0,0000,0001   ;2073            RC[0A]_Q,RETURN1
U 10CB, 0001,203E,0180,09D8,0000,0001   ;2074            RC[0B]_Q,RETURN1
U 10CC, 0001,203E,0180,09E0,0000,0001   ;2075            RC[0C]_Q,RETURN1
U 10CD, 0001,203E,0180,09E8,0000,0001   ;2076            RC[0D]_Q,RETURN1
U 10CE, 0001,203E,0180,09F0,0000,0001   ;2077            RC[0E]_Q,RETURN1
U 10CF, 0001,203E,0180,09F8,0000,0001   ;2078            RC[0F]_Q,RETURN1
                                        ;2079   ; THESE ARE USED TO READ THE RA AND RB SCRATCH PADS
                                        ;2080   ; INTO LA AND LB.
```

```
                                            ;2081   =0000
U 10E0, 0000,003E,0180,0A00,0000,0001       ;2082   LTCHAB: LAB_R[0],RETURN1
U 10E1, 0000,003E,0180,0A08,0000,0001       ;2083           LAB_R[1],RETURN1
U 10E2, 0000,003E,0180,0A10,0000,0001       ;2084           LAB_R[2],RETURN1
U 10E3, 0000,003E,0180,0A18,0000,0001       ;2085           LAB_R[3],RETURN1
U 10E4, 0000,003E,0180,0A20,0000,0001       ;2086           LAB_R[4],RETURN1
U 10E5, 0000,003E,0180,0A28,0000,0001       ;2087           LAB_R[5],RETURN1
U 10E6, 0000,003E,0180,0A30,0000,0001       ;2088           LAB_R[6],RETURN1
U 10E7, 0000,003E,0180,0A38,0000,0001       ;2089           LAB_R[7],RETURN1
U 10E8, 0000,003E,0180,0A40,0000,0001       ;2090           LAB_R[8],RETURN1
U 10E9, 0000,003E,0180,0A48,0000,0001       ;2091           LAB_R[9],RETURN1
U 10EA, 0000,003E,0180,0A50,0000,0001       ;2092           LAB_R[0A],RETURN1
U 10EB, 0000,003E,0180,0A58,0000,0001       ;2093           LAB_R[0B],RETURN1
U 10EC, 0000,003E,0180,0A60,0000,0001       ;2094           LAB_R[0C],RETURN1
U 10ED, 0000,003E,0180,0A68,0000,0001       ;2095           LAB_R[0D],RETURN1
U 10EE, 0000,003E,0180,0A70,0000,0001       ;2096           LAB_R[0E],RETURN1
U 10EF, 0000,003E,0180,0A78,0000,0001       ;2097           LAB_R[0F],RETURN1
                                            ;2098   ; THESE ARE USED TO READ THE RC SCRATCH PADS INTO LC.
                                            ;2099   =0000
U 1120, 0000,003E,0180,0900,0000,0001       ;2100   LTCHRC: LC_RC[0],RETURN1
U 1121, 0000,003E,0180,0908,0000,0001       ;2101           LC_RC[1],RETURN1
U 1122, 0000,003E,0180,0910,0000,0001       ;2102           LC_RC[2],RETURN1
U 1123, 0000,003E,0180,0918,0000,0001       ;2103           LC_RC[3],RETURN1
U 1124, 0000,003E,0180,0920,0000,0001       ;2104           LC_RC[4],RETURN1
U 1125, 0000,003E,0180,0928,0000,0001       ;2105           LC_RC[5],RETURN1
U 1126, 0000,003E,0180,0930,0000,0001       ;2106           LC_RC[6],RETURN1
U 1127, 0000,003E,0180,0938,0000,0001       ;2107           LC_RC[7],RETURN1
U 1128, 0000,003E,0180,0940,0000,0001       ;2108           LC_RC[8],RETURN1
U 1129, 0000,003E,0180,0948,0000,0001       ;2109           LC_RC[9],RETURN1
U 112A, 0000,003E,0180,0950,0000,0001       ;2110           LC_RC[0A],RETURN1
U 112B, 0000,003E,0180,0958,0000,0001       ;2111           LC_RC[0B],RETURN1
U 112C, 0000,003E,0180,0960,0000,0001       ;2112           LC_RC[0C],RETURN1
U 112D, 0000,003E,0180,0968,0000,0001       ;2113           LC_RC[0D],RETURN1
U 112E, 0000,003E,0180,0970,0000,0001       ;2114           LC_RC[0E],RETURN1
U 112F, 0000,003E,0180,0978,0000,0001       ;2115           LC_RC[0F],RETURN1
                                            ;2116   ; THIS ROUTINE IS USED TO FILL ALL RA AND RB WITH THE
                                            ;2117   ; CONTENTS OF Q.
                                            ;2118   =0
U 102C, 0F00,003D,0180,0800,0000,1222       ;2119   RARB.Q: D_0,CALL,J/DC.NF
U 102D, 0000,003C,0180,0800,0000,1030       ;2120           NOP
                                            ;2121   =0
U 1030, 0000,193D,0180,0800,0000,10A0       ;2122   RARB.QA:        CALL,D3-0?,J/WRRARB
U 1031, 0819,0014,0580,0800,0010,1235       ;2123           D_D+K[.1],CLK.UBCC
U 1235, 0000,013C,0180,0800,0000,1034       ;2124           Z?
U 1034, 0000,003C,0180,0800,0000,1030       ;2125   =0      J/RARB.QA
U 1035, 0000,003E,0180,0800,0000,0001       ;2126           RETURN1
                                            ;2127   ; THIS ROUTINE IS USED TO FILL ALL RC WITH THE
                                            ;2128   ; CONTENTS OF Q.
                                            ;2129   =0
U 103C, 0F00,003D,0180,0800,0000,1222       ;2130   RC.Q:   D_0,CALL,J/DC.NF
U 103D, 0000,003C,0180,0800,0000,1040       ;2131           NOP
                                            ;2132   =0
U 1040, 0000,193D,0180,0800,0000,10C0       ;2133   RC.QA:  CALL,D3-0?,J/WRRC
U 1041, 0819,0014,0580,0800,0010,1236       ;2134           D_D+K[.1],CLK.UBCC
U 1236, 0000,013C,0180,0800,0000,1042       ;2135           Z?
```

```
U 1042, 0000,003C,0180,0800,0000,1040   ;2136   =0      J/RC.QA
U 1043, 0000,003E,0180,0800,0000,0001   ;2137           RETURN1
```

```
                                          ;2138          .PAGE   "TEST 90        BEN STATE<03:00> TEST"
                                          ;2139   ;*******************************************************************
                                          ;2140   ;++
                                          ;2141   ; TEST  90      BEN STATE<03:00> TEST
                                          ;2142   ;
                                          ;2143   ; TEST DESCRIPTION
                                          ;2144   ;       THIS IS A TEST OF BEN 17 WHICH IS DEPENDENT UPON
                                          ;2145   ;       THE CONTENTS OF THE STATE REGISTER'S BITS <03:00>.
                                          ;2146   ;
                                          ;2147   ; ERROR DESCRIPTION
                                          ;2148   ;       LOW ORDER FOUR BITS OF THE ADDRESS BRANCH WENT TO
                                          ;2149   ;       CONTENTS OF STATE
                                          ;2150   ;
                                          ;2151   ;--
                                          ;2152   ;*******************************************************************
                                          ;2153   =0
U 1048, 0000,003D,0180,0800,0000,10BE     ;2154   STB1:   NEWTST
U 1049, 0018,0038,0980,09F8,0000,1237     ;2155           R[0F]_K[.2]
U 1237, 0018,0038,6180,0A80,0000,104A     ;2156           R[0]_K[.F]              ; SET UP COUNTER
U 104A, 0000,003D,0180,0800,0000,1166     ;2157   =0      ERLOOP
U 104B, 0000,003C,0180,0A00,0082,1238     ;2158   STB1A:  SC_R[0]                 ; GET THE TEST DATA, A COUNT PATTERN.
U 1238, 0800,003C,0180,09E8,0100,1239     ;2159           R[0D]_LA,FE_SC,D_ALU
U 1239, 0000,003C,0180,0800,1400,723A     ;2160           STATE_FE                ; LOAD DATA INTO STATE REGISTER
U 123A, 0018,0038,61C0,0800,0000,123B     ;2161           Q_K[.F]
U 123B, 081D,2000,01C0,0800,0000,1008     ;2162           ALU_Q-D,D_ALU,Q_ALU
U 1008, 0000,173D,0180,0800,0000,1080     ;2163   =00     STATE3-0?,CALL,J/BRTBLE ; TEST INSTRUCTION.
U 1009, 0001,203D,0180,09F0,0000,116E     ;2164           ERROR1,R[0E]_Q          ; BRANCH WENT TO WRONG ADDRESS.
U 100A, 0000,003C,0180,0A00,0010,100B     ;2165           ALU_R[0],CLK.UBCC       ; TRIED ALL TEST PATTERNS?
U 100B, 0000,013C,0180,0800,0000,104C     ;2166           Z?
U 104C, 0018,0000,0580,0A80,0000,104B     ;2167   =0      R[0]_LA-K[.1],J/STB1A   ; IF NOT DECREMENT PATTERN AND CONTINUE.
U 104D, 0000,003C,0180,0800,0000,1050     ;2168           NOP
```

```
                                                .PAGE   "TEST 91        BEN STATE<07:04> TEST"
                                        ;*******************************************************************
                                        ;++
                                        ; TEST  91      BEN STATE<07:04> TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF BEN 16 WHICH IS DEPENDENT UPON
                                        ;       THE CONTENTS OF THE STATE REGISTER'S BIT2 <07:04>.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       LOW ORDER 4 BITS OF THE ADDRESS THE BRANCH ACTUALLY WENT TO
                                        ;       STATE REGISTER CONTENTS
                                        ;
                                        ;--
                                        ;*******************************************************************
                                        =0
U 1050, 0000,003D,0180,0800,0000,10BE   STB2:   NEWTST
U 1051, 0018,0038,0980,09F8,0000,123C           RC[0F]_K[.2]
U 123C, 0018,0038,6180,0A80,0000,123D           R[0]_K[.F]              ; SET UP A CCUNTER
U 123D, 0018,0038,CD80,0A88,0000,1052           R[1]_K[.F0]
U 1052, 0000,003D,0180,0800,0000,1166   =0      ERLOOP
U 1053, 0000,003C,0180,0A08,0082,123E   STB2A:  SC_R[1]                 ; GET TEST DATA, A COUNT PATTERN IN BITS<7:4>
U 123E, 0800,003C,0180,09E8,0100,123F           RC[0D]_LA,FE_SC,D_ALU
U 123F, 0000,003C,0180,0800,1400,7240           STATE_FE                ; LOAD STATE WITH DATA
U 1240, 0018,0038,61C0,0800,0000,1241           Q_K[.F]
U 1241, 0800,003C,0180,0A00,0000,1242           D_R[0]
U 1242, 081D,2000,01C0,0800,0000,1018           ALU_Q-D,D_ALU,Q_ALU
U 1018, 0000,163D,0180,0800,0000,1080   =00     STATE7-4?_CALL,J/BRTBLE ; TEST INSTRUCTION
U 1019, 0001,203D,0180,09F0,0000,116E           ERROR1,RC[0E]_Q         ; BRANCH WENT TO WRONG ADDRESS
U 101A, 0000,003C,1180,0A08,0084,701B           LAB_R[1],SC_K[.4]
U 101B, 0003,001C,01C0,0800,0000,1243           ALU_NOT.MASK,Q_ALU
U 1243, 001C,0000,0180,0A88,0000,1244           ALU_LA[A-B]Q,R[1]_ALU
U 1244, 0000,003C,0180,0A00,0010,1245           ALU_R[0],CLK.UBCC       ; TRIED ALL APTTERNS YET
U 1245, 0000,013C,0180,0800,0000,1058           Z?
U 1058, 0018,0000,0580,0A80,0000,1053   =0      R[0]_LA-K[.1],J/STB2A   ; IF NOT CONTINUE
U 1059, 0000,003C,0180,0800,0000,105C           NOP
```

```
                                          ;2205          .PAGE   "TEST 92        BEN SS (SIGN SOURCE) TEST"
                                          ;2206   ;****************************************************************
                                          ;2207   ;++
                                          ;2208   ; TEST  92      BEN SS (SIGN SOURCE) TEST
                                          ;2209   ;
                                          ;2210   ; TEST DESCRIPTION
                                          ;2211   ;      THIS IS A TEST OF THE BEN 12 BIT WHICH IS DEPENDENT
                                          ;2212   ;      UPON THE STATE OF THE SS (SIGN SOURCE) BIT.
                                          ;2213   ;
                                          ;2214   ; ERROR DESCRIPTION
                                          ;2215   ;      NO ERROR DATA PRINT OUT USED
                                          ;2216   ;
                                          ;2217   ;--
                                          ;2218   ;****************************************************************
                                          ;2219   =0
U 105C, 0000,003D,0180,0800,0000,10BE     ;2220   SSBEN:  NEWTST
U 105D, 0018,0038,1980,09F8,0000,1246     ;2221           RC[OF]_K[ZERO]
U 1246, 0000,003C,0187,0800,0000,1247     ;2222           SGN/7                     ; CLEAR SS
U 1247, 0000,123C,0180,0800,0000,100E     ;2223           BEN/EALU                  ; BRANCH BIT SS=0
U 100E, 0000,003C,0180,0800,0000,1248     ;2224   =1110   J/SSBEN1
U 100F, 0000,003D,0180,0800,0000,116E     ;2225           ERROR1                    ; BRANCH ASSERTED WITH SS=0
U 1248, 0000,003C,6180,0800,0084,7249     ;2226   SSBEN1: SC_K[.F]
U 1249, 0003,001C,0181,0800,0000,124A     ;2227           ALU_NOT.MASK,SGN/1        ; SET SS
U 124A, 0000,123C,0180,0800,0000,101E     ;2228           BEN7EALU                  ; BRANCH BIT=SS=1
U 101E, 0000,003D,0180,0800,0000,116E     ;2229   =11110  ERROR1                    ; BRANCH DEASSERTED WITH SS=1
U 101F, 0000,003C,0180,0800,0000,1070     ;2230           NOP
```

```
                                                 .PAGE   "TEST 93        BEN LA<01:00> TEST"
                                         ;*****************************************************************
                                         ;++
                                         ; TEST  93      BEN LA<01:00> TEST
                                         ;
                                         ; TEST DESCRIPTION
                                         ;        THIS IS A TEST OF THE BEN 2 WHICH IS DEPENDENT UPON
                                         ;        LA<01:00>
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;        EXPECTED LA <01:00>
                                         ;
                                         ;--
                                         ;*****************************************************************
                                         =0
U 1070, 0000,003D,0180,0800,0000,10BE    ROR1:   NEWTST
U 1071, 0018,0038,0580,09F8,0000,1072            RC[OF]_K[.1]
U 1072, 0000,003D,0180,0800,0000,1166    =0      ERLOOP
U 1073, 0018,0038,1980,0A80,0000,124B            R[0]_K[ZERO]
U 124B, 0000,003C,0180,0A00,0000,124C            LAB_R[0]
U 124C, 0003,023C,0180,09F0,0000,1002            BEN7ROR,RC[OE]_0          ; LA<01:00>=00, TEST INSTRUCTION
U 1002, 0000,003C,0180,0800,0000,1078    =010    J/ROR2
U 1003, 0000,003D,0180,0800,0000,116E            ERROR1                    ; BRANCH WENT TO WRONG ADDRESS
U 1006, 0000,003D,0180,0800,0000,116E            ERROR1
U 1007, 0000,003D,0180,0800,0000,116E            ERROR1
                                         =0
U 1078, 0000,003D,0180,0800,0000,1166    ROR2:   ERLOOP
U 1079, 0018,0038,0580,0A80,0000,124D            R[0]_K[.1]
U 124D, 0000,003C,0180,0A00,0000,124E            LAB_R[0]
U 124E, 0018,0238,0580,09F0,0000,1012            BEN7ROR,RC[OE]_K[.1]      ; LA<01:00>=01, TEST INSTRUCTION
U 1012, 0000,003D,0180,0800,0000,116E    =010    ERROR1                    ; BRANCH WENT TO WRONG ADDRESS
U 1013, 0000,003C,0180,0800,0000,107A            J/ROR3
U 1016, 0000,003D,0180,0800,0000,116E            ERROR1
U 1017, 0000,003D,0180,0800,0000,116E            ERROR1
                                         =0
U 107A, 0000,003D,0180,0800,0000,1166    ROR3:   ERLOOP
U 107B, 0018,0038,0980,0A80,0000,124F            R[0]_K[.2]
U 124F, 0000,003C,0180,0A00,0000,1250            LAB_R[0]
U 1250, 0018,0238,0980,09F0,0000,1022            BEN7ROR,RC[OE]_K[.2]      ; LA<01:00>=10, TEST INSTRUCTION
U 1022, 0000,003D,0180,0800,0000,116E    =010    ERROR1                    ; BRANCH WENT TO WRONG ADDRESS
U 1023, 0000,003D,0180,0800,0000,116E            ERROR1
U 1026, 0000,003C,0180,0800,0000,1090            J/ROR4
U 1027, 0000,003D,0180,0800,0000,116E            ERROR1
                                         =0
U 1090, 0000,003D,0180,0800,0000,1166    ROR4:   ERLOOP
U 1091, 0018,0038,0D80,0A80,0000,1251            R[0]_K[.3]
U 1251, 0000,003C,0180,0A00,0000,1252            LAB_R[0]
U 1252, 0018,0238,0D80,09F0,0000,1032            BEN7ROR,RC[OE]_K[.3]      ; LA<01:00>=11, TEST INSTRUCTION
U 1032, 0000,003D,0180,0800,0000,116E    =010    ERROR1                    ; BRANCH WENT TO WRONG ADDRESS
U 1033, 0000,003D,0180,0800,0000,116E            ERROR1
U 1036, 0000,003D,0180,0800,0000,116E            ERROR1
U 1037, 0000,003C,0180,0800,0000,1092            NOP
```

```
                                               ;2283          .PAGE   "TEST 94        BEN D<01:00> (BEN/0C) TEST"
                                               ;2284   ;***************************************************************
                                               ;2285   ;++
                                               ;2286   ; TEST  94      BEN D<01:00> (BEN/0C) TEST
                                               ;2287   ;
                                               ;2288   ; TEST DESCRIPTION
                                               ;2289   ;       THIS IS A TEST OF BEN C WHICH IS DEPENDENT UPON
                                               ;2290   ;       D<01:00>
                                               ;2291   ;
                                               ;2292   ; ERROR DESCRIPTION
                                               ;2293   ;       THE LOW TWO BITS OF WHERE BRANCH WAS EXPECTED TO GO
                                               ;2294   ;
                                               ;2295   ;--
                                               ;2296   ;***************************************************************
                                               ;2297   =0
U 1092, 0018,0039,0580,09F8,0000,10BE          ;2298   DBEN1:  NEWTST[.1]
U 1093, 0F03,003C,0180,09F0,0000,1253          ;2299           D_0,RC[0E]_0
U 1253, 0018,0038,C180,0800,0000,1254          ;2300           ALU_K[.FFFF]
U 1254, 0100,0C3C,0380,0800,0000,1044          ;2301           D_D.LEFT2,SI/7,BEN/MUL  ; D<01:00>=0C, TEST INSTRUCTION
U 1044, 0000,003C,0180,0800,0000,1098          ;2302   =100    J/DBEN2
U 1045, 0000,003D,0180,0800,0000,116E          ;2303           ERROR1                  ; BRANCH WENT TO WRONG ADDRESS
U 1046, 0000,003D,0180,0800,0000,116E          ;2304           ERROR1
U 1047, 0000,003D,0180,0800,0000,116E          ;2305           ERROR1
                                               ;2306   =0
U 1098, 0000,003D,0180,0800,0000,1166          ;2307   DBEN2:  ERLOOP
U 1099, 0818,0038,0580,09F0,0000,1255          ;2308           ALU_K[.1],D_ALU,RC[0E]_ALU
U 1255, 0018,0038,0980,0800,0000,1256          ;2309           ALU_K[.2]
U 1256, 0100,0C3C,0380,0800,0000,1054          ;2310           D_D.LEFT2,SI/7,BEN/MUL  ; D<01:00>=01, TEST INSTRUCTION
U 1054, 0000,003D,0180,0800,0000,116E          ;2311   =100    ERROR1                  ; BRANCH WENT TO WRONG ADDRESS
U 1055, 0000,003C,0180,0800,0000,109A          ;2312           J/DBEN3
U 1056, 0000,003D,0180,0800,0000,116E          ;2313           ERROR1
U 1057, 0000,003D,0180,0800,0000,116E          ;2314           ERROR1
                                               ;2315   =0
U 109A, 0000,003D,0180,0800,0000,1166          ;2316   DBEN3:  ERLOOP
U 109B, 0818,0038,0980,09F0,0000,1257          ;2317           ALU_K[.2],D_ALU,RC[0E]_ALU
U 1257, 0018,0038,0580,0800,0000,1258          ;2318           ALU_K[.1]
U 1258, 0100,0C3C,0380,0800,0000,1074          ;2319           D_D.LEFT2,SI/7,BEN/MUL  ; D<01:00>=10, TEST INSTRUCTION
U 1074, 0000,003D,0180,0800,0000,116E          ;2320   =100    ERROR1                  ; BRANCH WENT TO WRONG ADDRESS
U 1075, 0000,003D,0180,0800,0000,116E          ;2321           ERROR1
U 1076, 0000,003C,0180,0800,0000,10B8          ;2322           J/DBEN4
U 1077, 0000,003D,0180,0800,0000,116E          ;2323           ERROR1
                                               ;2324   =0
U 10B8, 0000,003D,0180,0800,0000,1166          ;2325   DBEN4:  ERLOOP
U 10B9, 0818,0038,0D80,09F0,0000,1259          ;2326           ALU_K[.3],D_ALU,RC[0E]_ALU
U 1259, 0018,0038,1980,0800,0000,125A          ;2327           ALU_0(K)
U 125A, 0100,0C3C,0380,0800,0000,1094          ;2328           D_D.LEFT2,SI/7,BEN/MUL  ; D<01:00>=11, TEST INSTRUCTION
U 1094, 0000,003D,0180,0800,0000,116E          ;2329   =100    ERROR1                  ; BRANCH WENT TO WRONG ADDRESS
U 1095, 0000,003D,0180,0800,0000,116E          ;2330           ERROR1
U 1096, 0000,003D,0180,0800,0000,116E          ;2331           ERROR1
U 1097, 0000,003C,0180,0800,0000,10BA          ;2332           NOP
```

```
                                                  .PAGE   "TEST 95        BEN/OF TEST 1"
                                          ;*************************************************************
                                          ;++
                                          ; TEST  95      BEN/OF TEST 1
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS IS A TEST OF THE BEN F BIT WHICH IS DEPENDENT UPON
                                          ;       THE D REGISTER BEING WITHIN THE LIMITS:
                                          ;               30.LE.D<07:00>.LE.39    (IN HEX)
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       D REGISTER
                                          ;       ERROR CODE:
                                          ;               0=> BRANCH FAILED TO BE DEASSERTED
                                          ;               1=> BRANCH FAILED TO BE ASSERTED
                                          ;
                                          ;--
                                          ;*************************************************************
                                          =0
U 10BA, 0000,003D,0180,0800,0000,10BE     DDBEN1: NEWTST
U 10BB, 0818,0038,8580,0800,0000,10D8             D_K[.C]
U 10D8, 0000,003D,0180,0800,0000,1065     =0      CALL,J/DC5
U 10D9, 0001,003C,0180,0A80,0000,125B             R[0]_D                  ; R[0]=C6
U 125B, 0018,0038,4980,0A88,0000,125C             R[1]_K[.FF]
U 125C, 0018,0038,0980,09F8,0000,10DC             RC[0F]_K[.2]
                                          ; BRANCH SHOULD NOT ASSERT WITH D= FF THRU 3A.
U 10DC, 0000,003D,0180,0800,0000,1166     =0      ERLOOP
U 10DD, 0800,003C,0180,0A08,0000,125D     DDBEN2: D_R[1]
U 125D, 0003,0F3C,0180,09E8,0000,10B1             BEN/DECIMAL,RC[0D]_0 ; BRANCH BIT=0, TEST INSTRUCTION
U 10B1, 0000,003C,0180,0A08,0000,125E     =001    J/DDBEN3,LAB_R[1]
U 10B3, 0001,003D,0180,09F0,0000,116E             ERROR1,RC[0E]_D         ; BRANCH WENT TO WRONG ADDRESS
U 10B5, 0001,003D,0180,09F0,0000,116E             ERROR1,RC[0E]_D
U 10B7, 0001,003D,0180,09F0,0000,116E             ERROR1,RC[0E]_D
U 125E, 0018,0000,0580,0A88,0000,125F     DDBEN3: R[1]_LA-K[.1]           ; TRIED ALL PATTERNS FF THRU 3A?
U 125F, 0000,003C,0180,0A00,0010,1260             ALU_R[0],CLK.UBCC
U 1260, 0000,013C,0180,0800,0000,10F8             Z?
U 10F8, 0018,0000,0580,0A80,0000,10DD     =0      R[0]_LA-K[.1],J/DDBEN2  ; IF NOT CONTINUE
U 10F9, 0018,0038,D980,0A80,0000,10FC             R[0]_K[.9]
                                          ; BRANCH SHOULD ASSERT WITH D= 39 THRU 30
U 10FC, 0000,003D,0180,0800,0000,1166     =0      ERLOOP
U 10FD, 0800,003C,0180,0A08,0000,1261     DDBEN4: D_R[1]
U 1261, 0018,0F38,0580,09E8,0000,10D1             BEN/DECIMAL,RC[0D]_K[.1] ; BRANCH BIT=1, TEST INSTRUCTION
U 10D1, 0001,003D,0180,09F0,0000,116E     =001    ERROR1,RC[0E]_D         ; BRANCH WENT TO WRONG ADDRESS
U 10D3, 0000,003C,0180,0A08,0000,1262             J/DDBEN5,LAB_R[1]
U 10D5, 0001,003D,0180 09F0,0000,116E             ERROR1,RC[0E]_D
U 10D7, 0001,003D,0180,09F0,0000,116E             ERROR1,RC[0E]_D
U 1262, 0018,0000,0580,0A88,0000,1263     DDBEN5: R[1]_LA-K[.1]           ; TRIED ALL PATTERNS 39 THRU 30?
U 1263, 0000,003C,0180,0A00,0010,1264             ALU_R[0],CLK.UBCC
U 1264, 0000,013C,0180,0800,0000,110A             Z?
U 110A, 0018,0000,0580,0A80,0000,10FD     =0      R[0]_LA-K[.1],J/DDBEN4  ; IF NOT CONTINUE
U 110B, 0800,003C,0180,0A08,0000,1265             D_R[1]
U 1265, 0001,003C,0180,0A80,0000,1110             R[0]_D                  ; R[0]=2F
                                          ; BRANCH SHOULD NOT ASSERT WITH D= 2F THRU 00
U 1110, 0000,003D,0180,0800,0000,1166     =0      ERLOOP
U 1111, 0800,003C,0180,0A08,0000,1266     DDBEN6: D_R[1]
```

```
U 1266, 0003,0F3C,0180,09E8,0000,10F1   ;2388           BEN/DECIMAL,RC[0D]_0    ; BRANCH BIT=0, TEST INSTRUCTION
U 10F1, 0000,003C,0180,0A08,0000,1267   ;2389   =001    J/DDBEN7,LAB_R[1]
U 10F3, 0001,003D,0180,09F0,0000,116E   ;2390           ERROR1,RC[0E]_D         ; BRANCH WENT TO WRONG ADDRESS
U 10F5, 0001,003D,0180,09F0,0000,116E   ;2391           ERROR1,RC[0E]_D
U 10F7, 0001,003D,0180,09F0,0000,116E   ;2392           ERROR1,RC[0E]_D
U 1267, 0018,0000,0580,0A88,0000,1268   ;2393   DDBEN7: R[1]_LA-K[.1]           ; TRIED ALL PATTERNS 2F THRU 00?
U 1268, 0000,003C,0180,0A00,0010,1269   ;2394           ALU_R[0],CLK.UBCC
U 1269, 0000,013C,0180,0800,0000,1114   ;2395           Z?
U 1114, 0018,0000,0580,0A80,0000,1111   ;2396   =0      R[0]_LA-K[.1],J/DDBEN6  ; IF NOT CONTINUE
U 1115, 0000,003C,0180,0800,0000,1118   ;2397           NOP
```

```
                                     ;2398          .PAGE   "TEST 96        BEN/OF TEST 2"
                                     ;2399   ;*****************************************************************
                                     ;2400   ;++
                                     ;2401   ; TEST  96      BEN/OF TEST 2
                                     ;2402   ;
                                     ;2403   ; TEST DESCRIPTION
                                     ;2404   ;       THIS IS A TEST OF THE BEN F BIT WHICH IS
                                     ;2405   ;       ASSERTED WHEN:
                                     ;2406   ;               D<02:00>=5
                                     ;2407   ;                OR
                                     ;2408   ;               D<02:00>=3
                                     ;2409   ;                OR
                                     ;2410   ;               D<02:00>=1
                                     ;2411   ;
                                     ;2412   ; ERROR DESCRIPTION
                                     ;2413   ;       D REGISTER
                                     ;2414   ;       ERROR CODE:
                                     ;2415   ;               0=> BRANCH FAILED TO BE DEASSERTED
                                     ;2416   ;               1=> BRANCH FAILED TO BE ASSERTED
                                     ;2417   ;
                                     ;2418   ;--
                                     ;2419   ;*****************************************************************
                                     ;2420   =0
U 1118, 0000,003D,0180,0800,0000,10BE ;2421   BDBEN1: NEWTST
U 1119, 0018,0038,6180,0A88,0000,126A ;2422           R[1]_K[.F]
U 126A, 0018,0038,0580,09F8,0000,111C ;2423           RC[0F]_K[.1]
U 111C, 0000,003D,0180,0800,0000,1166 ;2424   =0      ERLOOP
U 111D, 0F00,003C,0180,0800,0000,1130 ;2425   BDBEN2: D_0
U 1130, 0000,003D,0180,0800,0000,1065 ;2426   =0      CALL,J/DC5
U 1131, 0000,003C,01E0,0800,0000,126B ;2427           Q_D                     ; Q=5
U 126B, 0800,003C,0180,0A08,0000,126C ;2428           D_R[1]                  ; SEE IF D<2:0>=5
U 126C, 0819,0024,0180,0800,0000,126D ;2429           A[U_D.ANDNOT.K[.8],D_ALU
U 126D, 001D,2000,0180,0800,0010,126E ;2430           ALU_Q-D,CLK.UBCC
U 126E, 0000,013C,0180,0800,0000,1134 ;2431           Z?
U 1134, 0000,003C,0180,0800,0000,126F ;2432   =0      J/BDBENA
U 1135, 0000,003C,0180,0800,0000,1276 ;2433           J/BDBEN3                ; IF YES THEN BRANCH WILL ASSERT.
U 126F, 0018,0038,0DC0,0800,0000,1270 ;2434   BDBENA: Q_K[.3]                 ; SEE IF D<2:0>=3
U 1270, 001D,2000,0180,0800,0010,1271 ;2435           A[U_Q-D,CLK.UBCC
U 1271, 0000,013C,0180,0800,0000,1138 ;2436           Z?
U 1138, 0000,003C,0180,0800,0000,1272 ;2437   =0      J/BDBENB
U 1139, 0000,003C,0180,0800,0000,1276 ;2438           J/BDBEN3                ; IF YES THEN BRANCH WILL ASSERT
U 1272, 0019,0000,0580,0800,0010,1273 ;2439   BDBENB: ALU_D-K[.1],CLK.UBCC    ; SEE IF D<2:0>=1
U 1273, 0000,013C,0180,0800,0000,113A ;2440           Z?
U 113A, 0000,003C,0180,0800,0000,1274 ;2441   =0      J/BDBENC                ; IF NOT THEN BRANCH WILL NOT ASSERT
U 113B, 0000,003C,0180,0800,0000,1276 ;2442           J/BDBEN3                ; IF YES THEN BRANCH WILL ASSERT
                                     ;2443   ; COME HERE IF BRANCH WILL NOT ASSERT:
U 1274, 0800,003C,0180,0A08,0000,1275 ;2444   BDBENC: D_R[1]
U 1275, 0000,0F3C,0180,0800,0000,1112 ;2445           BEN/DECIMAL             ; BRANCH BIT=0, TEST INSTRUCTION
U 1112, 0000,003C,0180,0800,0000,1278 ;2446   =010    J/BDBEN4
U 1113, 0001,003D,0180,09F0,0000,116E ;2447           ERROR1,RC[0E]_D         ; BRANCH WENT TO WRONG ADDRESS
U 1116, 0001,003D,0180,09F0,0000,116E ;2448           ERROR1,RC[0E]_D
U 1117, 0001,003D,0180,09F0,0000,116E ;2449           ERROR1,RC[0E]_D
                                     ;2450   ; COME HERE IF BRANCH SHOULD ASSERT:
U 1276, 0800,003C,0180,0A08,0000,1277 ;2451   BDBEN3: D_R[1]
U 1277, 0000,0F3C,0180,0800,0000,1132 ;2452           BEN/DECIMAL             ; BRANCH BIT=1, TEST INSTRUCTION
```

```
U 1132, 0001,003D,0180,09F0,0000,116E    ;2453    =010     ERROR1,RC[OE]_D           ; BRANCH WENT TO WRONG ADDRESS
U 1133, 0000,003C,0180,0800,0000,1278    ;2454             J/BDBEN4
U 1136, 0001,003D,0180,09F0,0000,116E    ;2455             ERROR1,RC[OE]_D
U 1137, 0001,003D,0180,09F0,0000,116E    ;2456             ERROR1,RC[OE]_D
U 1278, 0000,003C,0180,0A08,0010,1279    ;2457    BDBEN4:  ALU_R[1],CLK.UBCC         ; TRIED ALL TEST PATTERNS?
U 1279, 0000,013C,0180,0800,0000,113C    ;2458             Z?
U 113C, 0018,0000,0580,0A88,0000,111D    ;2459    =0       R[1]_LA-K[.1],J/BDBEN2    ; IF NOT CONTINUE
U 113D, 0000,003C,0180,0800,0000,1140    ;2460             NOP
```

```
                                              .PAGE   "TEST 97        BEN PTE VALID TEST"
                                      ;*****************************************************************
                                      ;++
                                      ; TEST  97      BEN PTE VALID TEST
                                      ;
                                      ; TEST DESCRIPTION
                                      ;       THIS IS A TEST OF THE BEN 1D BIT WHICH IS ASSERTED
                                      ;       WHEN THE D REGISTER CONTAINS A VALID TRANSLATION BUFFER
                                      ;       PTE. A VALID PTE IS ONE IN WHICH BITS <25:21>=0.
                                      ;
                                      ; ERROR DESCRIPTION
                                      ;       D REGISTER CONTENTS
                                      ;
                                      ;--
                                      ;*****************************************************************
                                      =0
U 1140, 0000,003D,0180,0800,0000,10BE  PTEV1:  NEWTST
U 1141, 0018,0038,0580,09F8,0000,127A          RC[OF]_K[.1]
U 127A, 0000,003C,E580,0800,0084,727B          SC_K[.1A]               ; GENERATE SOME DATA PATTERNS.
U 127B, 0003,0010,01C0,0800,0000,127C          ALU_MASK+1,Q_ALU        ; Q=FC000000
U 127C, 0000,003C,0580,0800,0084,B27D          SC_SC-K[.1]
U 127D, 0000,003C,1180,0800,0084,B27E          SC_SC-K[.4]
U 127E, 0803,0010,0180,0800,0000,127F          ALU_MASK+1,D_ALU        ; D=FFE00000
U 127F, 081D,0024,0180,0AB0,0000,1280          ALU_D[ANDNOT]Q,D_ALU,R[6]_ALU ; R[6]=03E00000
U 1280, 0000,003C,5D80,0800,0084,7281          SC_K[.7]
U 1281, 0D00,003C,0180,0800,0000,1282          D_DAL.SC                ; D=E0000000
U 1282, 0000,003C,8D80,0800,0084,7283          SC_K[.1F]
U 1283, 0001,0034,0180,0AB8,0000,1284          ALU_D.AND.MASK,R[7]_ALU ; R[7]=60000000
U 1284, 0000,003C,2180,0800,0084,7285          SC_K[.14]
U 1285, 0803,001C,0180,0AA8,0000,1286          ALU_NOT.MASK,R[5]_ALU,D_ALU ; R[5]=00100000, TEST PATTERN INCREMENT
U 1286, 0001,003C,0180,0AA0,0000,1142          R[4]_D                  ; R[4]=00100000, INITIAL TEST PATTERN
U 1142, 0000,003D,0180,0800,0000,1166  =0      ERLOOP
U 1143, 0800,003C,0180,0A20,0000,1287  PTEV2:  D_R[4]                  ; DETERMINE IF THE CURRENT
U 1287, 0001,003C,0180,09F0,0000,1288          RC[OE]_D                ; TEST PATTERN IS A VALID PTE
U 1288, 0000,0D3C,0180,0800,0000,1156          D31?                    ; OR NOT
U 1156, 0000,003C,0180,0800,0000,1149  =110    J/PTEINV                ; PTE INVALID
U 1157, 001C,2034,0180,0A30,0010,1289          LAB_R[6],ALU_LA[AND]D,CLK.UBCC
U 1289, 0000,013C,0180,0800,0000,1144          Z?
U 1144, 0000,003C,0180,0800,0000,1149  =0      J/PTEINV                ; PTE INVALID
U 1145, 001C,2034,0180,0A38,0010,128A          LAB_R[7],ALU_LA[AND]D,CLK.UBCC
U 128A, 0000,013C,0180,0800,0000,1148          Z?
U 1148, 0000,003C,0180,0800,0000,128B  =0      J/PTEVAL                ; PTE VALID
                                      ; THE DATA PATTERN IS AN INVALID PTE SO THE BRANCH BIT SHOULD ASSERT
U 1149, 0000,1D3C,0180,0800,0000,102F  PTEINV: BEN/TB.TEST             : BRANCH BIT IS 1, TEST INSTRUCTION
U 102F, 0018,0039,0580,09E8,0000,116E  =01111  ERROR1,RC[OD]_K[.1]      ; BRANCH WENT TO WRONG ADDRESS
U 103F, 0000,003C,0180,0800,0000,128C          J/PTEV4
                                      ; THE DATA PATTERN IS A VALID PTE SO THE BRANCH BIT SHOULD NOT ASSERT
U 128B, 0000,1D3C,0180,0800,0000,104F  PTEVAL: BEN/TB.TEST             ; BRANCH BIT IS 0, TEST INSTRUCTION.
U 104F, 0000,003C,0180,0800,0000,128C  =01111  J/PTEV4
U 105F, 0003,003D,0180,09E8,0000,116E          ERROR1,RC[OD]_0         ; BRANCH WENT TO WRONG ADDRESS.
U 128C, 0800,003C,0180,0A20,0010,128D  PTEV4:  D_R[4],CLK.UBCC         ; SEE IF ALL TEST PATTERNS HAVE BEEN TRIED.
U 128D, 0000,013C,0180,0A28,0000,114A          LAB_R[5],Z?             ; IF NOT INCREMENT THE TEST
U 114A, 001C,2014,0180,0AA0,0000,1143  =0      ALU_LA[A+B]D,R[4]_ALU,J/PTEV2 ; PATTERN AND CONTINUE.
U 114B, 0000,003C,0180,0800,0000,114C          NOP
```

```
                                         ;2515          .PAGE   "TEST 98        BEN PSL<27>, FPD, TEST"
                                         ;2516   ;******************************************************************
                                         ;2517   ;++
                                         ;2518   ; TEST  98      BEN PSL<27>, FIRST PART DONE, TEST
                                         ;2519   ;
                                         ;2520   ; TEST DESCRIPTION
                                         ;2521   ;       THIS IS A TEST OF THE BEN 11 BIT WHICH IS DEPENDENT UPON
                                         ;2522   ;       NOT PSL BIT <27> (NOT FIRST PART DONE).
                                         ;2523   ;
                                         ;2524   ; ERROR DESCRIPTION
                                         ;2525   ;       ERROR CODE:
                                         ;2526   ;               0=> BRANCH FAILED TO BE DEASSERTED
                                         ;2527   ;               1=> BRANCH FAILED TO BE ASSERTED
                                         ;2528   ;
                                         ;2529   ;--
                                         ;2530   ;*****************************************************************
                                         ;2531   =0
U 114C, 0018,0039,0580,09F8,0000,10BE    ;2532   FPDB:   NEWTST[.1]
U 114D, 0000,003C,ED80,0800,0084,728E    ;2533           SC_K[.1B]
U 128E, 0803,001C,0180,0800,0000,128F    ;2534           ALU_NOT.MASK,D_ALU      ; D=8000000
U 128F, 0000,003C,3D80,3C00,0000,1290    ;2535           ID[PSL]_D               ; SET THE PSL<27>
U 1290, 0000,113C,0180,0800,0000,1147    ;2536           FPD?                    ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
U 1147, 0000,003C,0180,0800,0000,1150    ;2537   =0111   J/FPDB1
U 114F, 0003,003D,0180,09F0,0000,116E    ;2538           ERROR1,RC[0E]_D         ; BRANCH WENT TO WRONG ADDRESS
                                         ;2539   =0
U 1150, 0000,003D,0180,0800,0000,1166    ;2540   FPDB1:  ERLOOP
U 1151, 0000,003C,ED80,0800,0084,7291    ;2541           SC_K[.1B]
U 1291, 0800,0038,0180,0800,0000,1292    ;2542           ALU_MASK,D_ALU          ; D=F7FFFFFF
U 1292, 0000,003C,3D80,3C00,0000,1293    ;2543           ID[PSL]_D               ; CLEAR PSL<27>
U 1293, 0000,113C,0180,0800,0000,1167    ;2544           FPD?                    ; TEST INSTRUCTION, BRANCH SHOULD ASSERT
U 1167, 0018,0039,0580,09F0,0000,116E    ;2545   =0111   ERROR1,RC[0E]_K[.1]     ; BRANCH WENT TO WRONG ADDRESS
U 116F, 0000,003C,0180,0800,0000,1152    ;2546           NOP
                                         ;2547   =0
U 1152, 0000,003D,0180,0800,0000,1166    ;2548   FPDB2:  ERLOOP
U 1153, 0000,003C,ED80,0800,0084,7294    ;2549           SC_K[.1B]
U 1294, 0803,001C,0180,0800,0000,1295    ;2550           ALU_NOT.MASK,D_ALU      ; D=8000000
U 1295, 0000,003C,3D80,3C00,0000,1296    ;2551           ID[PSL]_D               ; SET PSL<27>
U 1296, 0000,113C,0180,0800,0000,1187    ;2552           FPD?                    ; BRANCH SHOULD ASSERT
U 1187, 0000,003C,0180,0800,0000,1297    ;2553   =0111   J/FPDB3
U 118F, 0000,003D,0180,0800,0000,116E    ;2554           ERROR1                  ; BRANCH WENT TO WRONG ADDRESS
U 1297, 0000,003C,0180,0800,0000,1158    ;2555   FPDB3:  NOP
```

```
                                                 .PAGE   "TEST 99       BEN/1C TEST"
                                         ;*************************************************************
                                         ;++
                                         ; TEST  99      BEN/1C TEST
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS IS A TEST OF THE BEN 1C BIT WHICH IS ASSERTED BY:
                                         ;               (-PSL<IS>)*(-PSL<CM>)
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       ERROR CODE:
                                         ;               0=> BRANCH FAILED TO BE DEASSERTED
                                         ;               1=> BRANCH FAILED TO BE ASSERTED
                                         ;
                                         ;--
                                         ;*************************************************************
                                         =0
U 1158, 0000,003D,0180,0800,0000,10BE    ISCMB:  NEWTST
U 1159, 0018,0038,0580,09F8,0000,1298            RC[OF]_K[.1]
U 1298, 0F00,003C,0180,0800,0000,1299            D_0
U 1299, 0000,003C,3D80,3C00,0000,129A            ID[PSL]_D                  ; CLEAR THE PSL
U 129A, 0000,1C3C,0180,0800,0000,107D            PSL.MODE?                  ; TEST INSTRUCTION, BRANCH SHOULD ASSERT
U 107D, 0018,0039,0580,09F0,0000,116E    =11101  ERROR1,RC[OE]_K[.1]        ; BRANCH WENT TO WRONG ADDRESS
U 107F, 0000,003C,0180,0800,0000,115A            NOP
U 115A, 0000,003D,0180,0800,0000,1166    =0      ERLOOP
U 115B, 0000,003C,8D80,0800,0084,729B            SC_K[.1F]
U 129B, 0803,001C,0180,0800,0000,129C            ALU_NOT.MASK,D_ALU         ; D=80000000
U 129C, 0000,003C,3D80,3C00,0000,129D            ID[PSL]_D                  ; SET PSL<1F>
U 129D, 0000,1C3C,0180,0800,0000,109D            PSL.MODE?                  ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
U 109D, 0000,003C,0180,0800,0000,115C    =11101  J/ISCMB1
U 109F, 0003,003D,0180,09F0,0000,116E            ERROR1,RC[OE]_0            ; BRANCH WENT TO WRONG ADDRESS
                                          0
U 115C, 0000,003D,0180,0800,0000,1166    ISCMB1: ERLOOP
U 115D, 0000,003C,E580,0800,0084,729E            SC_K[.1A]
U 129E, 0803,001C,0180,0800,0000,129F            ALU_NOT.MASK,D_ALU         ; D=4000000
U 129F, 0000,003C,3D80,3C00,0000,12A0            ID[PSL]_D                  ; SET PSL<26>
U 12A0, 0000,1C3C,0180,0800,0000,10BD            PSL.MODE?                  ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
U 10BD, 0000,003C,0180,0800,0000,12A1    =11101  J/ISCMB2
U 10BF, 0018,0039,0580,09F0,0000,116E            ERROR1,RC[OE]_K[.1]        ; BRANCH WENT TO WRONG ADDRESS
U 12A1, 0F00,003C,0180,0800,0000,12A2    ISCMB2: D_0
U 12A2, 0000,003C,3D80,3C00,0000,1160            ID[PSL]_D
```

```
                                                 .PAGE   "TEST 9A       NESTED ERROR BIT, BEN/NEST.ERR AND CES<NEST.ERR> TES
                                         ;************************************************************************
                                         ;++
                                         ; TEST  9A      NESTED ERROR BIT TEST
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS IS A TEST OF THE MSC FIELD FUNCTIONS WHICH SET AND CLEAR
                                         ;       THE NEST.ERROR FLAG. ALSO TESTED IS THE BEN 11 BIT WHICH
                                         ;       IS ASSERTED BY NESTED ERROR BEING SET.
                                         ;       THE CES<16> NESTED ERROR BIT IS ALSO TESTED.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       EXPECTED CES REGISTER, JUST BIT 16 IS PERTAINENT
                                         ;       GOT CES REGISTER, JUST BIT 16 IS PERTAINENT
                                         ;       ERROR CODE:
                                         ;               0=> BRANCH FAILED TO BE DEASSERTED
                                         ;               1=> BRANCH FAILED TO BE ASSERTED
                                         ;               2=> *NOT* A BRANCH FAILURE
                                         ;       *NOTE*  IF ERROR CODE =0 .OR. 1,THEN IGNORE THE FIRST TWO
                                         ;               ERROR WORDS.
                                         ;
                                         ;--
                                         ;************************************************************************
                                         =0
U 1160, 0000,003D,0180,0800,0000,10BE    NESTR:  NEWTST
U 1161, 0018,0038,0D80,09F8,0000,1162            RC[0F]_K[.3]
U 1162, 0000,003D,0180,0800,0000,1166    =0      ERLOOP
U 1163, 0000,003C,0180,0800,2800,12A3            MSC/CLR.NEST.ERR        ; CLEAR THE NESTED ERROR BIT
U 12A3, 0000,113C,0180,0800,0000,119B            NEST.ERR?               ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
U 119B, 0000,003C,0180,0800,0000,1164    =1011   J/NESTR1
U 119F, 0003,003D,0180,09E0,0000,116E            ERROR1,RC[0C]_0         ; BRANCH WENT TO WRONG ADDRESS
                                         =0
U 1164, 0000,003D,0180,0800,0000,1166    NESTR1: ERLOOP
U 1165, 0000,003C,0180,0800,2C00,12A4            MSC/SET.NEST.ERR        ; SET THE NESTED ERROR BIT.
U 12A4, 0000,113C,0180,0800,0000,11AB            NEST.ERR?               ; TEST INSTRUCTION, BRANCH SHOULD ASSERT
U 11AB, 0018,0039,0580,09E0,0000,116E    =1011   ERROR1,RC[0C]_K[.1]     ; BRANCH WENT TO WRONG ADDRESS
U 11AF, 0000,003C,0180,0800,0000,1168            NOP
U 1168, 0000,003D,0180,0800,0000,1166    =0      ERLOOP
U 1169, 0000,003C,0180,0800,2800,12A5            MSC/CLR.NEST.ERR        ; CLEAR THE NESTED ERROR BIT
U 12A5, 0000,113C,0180,0800,0000,11BB            NEST.ERR?               ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
U 11BB, 0000,003C,0180,0800,0000,12A6    =1011   J/NESTR2
U 11BF, 0003,003D,0180,09E0,0000,116E            ERROR1,RC[0C]_0         ; BRANCH WENT TO WRONG ADDRESS
U 12A6, 0018,0038,0980,09E0,0000,116A    NESTR2: RC[0C]_K[.2]
U 116A, 0000,003D,0180,0800,0000,1166    =0      ERLOOP
U 116B, 0000,003C,6580,0800,0084,72A7            SC_K[.10]
U 12A7, 0003,001C,0180,09F0,0000,12A8            ALU_NOT.MASK,RC[0E]_ALU ; RC[0E]=10000
U 12A8, 0000,003C,0180,0800,2C00,12A9            MSC7SET.NEST.ERR        ; SET THE NESTED ERROR BIT
U 12A9, 0000,003C,31F0,2C00,0000,12AB            Q_ID[CES]               ; CHECK CES<16>
U 12AB, 0001,203C,0180,09E8,0000,12AC            RC[0D]_Q
U 12AC, 0001,2024,0180,0800,0010,12AD            ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS CES<16>=1?
U 12AD, 0000,013C,0180,0800,0000,116C            Z?
U 116C, 0000,003C,0180,0800,0000,1170    =0      J/NESTR3
U 116D, 0000,003D,0180,0800,0000,116E            ERROR1                  ; CES NESTED ERROR BIT INCORRECT
                                         =0
U 1170, 0000,003D,0180,0800,0000,1166    NESTR3: ERLOOP
```

```
U 1171, 0003,003C,0180,09F0,0000,12AE    ;2652          RC[0E]_0
U 12AE, 0000,003C,0180,0800,2800,12AF    ;2653          MSC/CLR.NEST.ERR            ; CLEAR NESTED ERROR BIT
U 12AF, 0000,003C,31F0,2C00,0000,12B0    ;2654          Q_ID[CES]                   ; CHECK CES<16>
U 12B0, 0001,203C,0180,09E8,0000,12B1    ;2655          RC[0D]_Q
U 12B1, 0001,2024,0180,0800,0010,12B2    ;2656          ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS CES NESTED ERROR BIT CORRECT
U 12B2, 0000,013C,0180,0800,0000,1172    ;2657          Z?
U 1172, 0000,003D,0180,0800,0000,116E    ;2658   =0     ERROR1                      ; CES NESTED ERROR BIT INCORRECT.
U 1173, 0000,003C,0180,0800,0000,1178    ;2659          NOP
U 1178, 0000,003D,0180,0800,0000,1166    ;2660   =0     ERLOOP
U 1179, 0003,001C,0180,09F0,0000,12B3    ;2661          RC[0E]_ALU,ALU_NOT.MASK ; RC[0E]=10000
U 12B3, 0000,003C,0180,0800,2C00,12B4    ;2662          MSC/SET.NEST.ERR            ; SET CES NESTED ERROR BIT
U 12B4, 0000,003C,31F0,2C00,0000,12B5    ;2663          Q_ID[CES]                   ; READ CES REGISTER
U 12B5, 0001,203C,0180,09E8,0000,12B6    ;2664          RC[0D]_Q
U 12B6, 0001,2024,0180,0800,0010,12B7    ;2665          ALU_Q.ANDNOT.MASK,CLK.UBCC ; WAS CES CORRECT?
U 12B7, 0000,013C,0180,0800,0000,117A    ;2666          Z?
U 117A, 0000,003C,0180,0800,0000,12B8    ;2667   =0     J/NESTR4
U 117B, 0000,003D,0180,0800,0000,116E    ;2668          ERROR1                      ; CES NESTED ERROR BIT INCORRECT
U 12B8, 0000,003C,0180,0800,2800,117C    ;2669   NESTR4: MSC/CLR.NEST.ERR
```

```
                                           ;2670          .PAGE   "TEST 9B        BEN PSL.CC TEST"
                                           ;2671    ;*****************************************************************
                                           ;2672    ;++
                                           ;2673    ; TEST  9B      BEN PSL.CC TEST
                                           ;2674    ;
                                           ;2675    ; TEST DESCRIPTION
                                           ;2676    ;       THIS IS A TEST OF BEN 1A WHICH IS DEPENDENT UPON THE
                                           ;2677    ;       PSL CC (PSL<3:0>) AND ALSO A TEST OF THE BEN 2 BIT WHICH IS
                                           ;2678    ;       ASSERTED BY PSL C BIT (PSL<0>).
                                           ;2679    ;
                                           ;2680    ; ERROR DESCRIPTION
                                           ;2681    ;       LOW ORDER 4 BITS OF WHERE THE BRANCH ACTUALLY WENT
                                           ;2682    ;       TEST DATA IN PSL
                                           ;2683    ;       ERROR CODE:
                                           ;2684    ;               0=> BEN 1A FAILED
                                           ;2685    ;               1=> BEN 2 FAILED
                                           ;2686    ;
                                           ;2687    ;--
                                           ;2688    ;*****************************************************************
                                           ;2689    =0
U 117C, 0000,003D,0180,0800,0000,10BE      ;2690    PSLCC:  NEWTST
U 117D, 0018,0038,6180,0A98,0000,1180      ;2691            R[3]_K[.F]                  ; INITIALIZE A COUNT DATA PATTERN
U 1180, 0000,003D,0180,0800,0000,1166      ;2692    =0      ERLOOP
U 1181, 0018,0038,0D80,09F8,0000,12B9      ;2693    PSLCC1: RC[0F]_K[.3]
U 12B9, 0003,003C,0180,09E0,0000,12BA      ;2694            RC[0C]_0
U 12BA, 0800,003C,0180,0A18,0000,12BB      ;2695            D_R[3]
U 12BB, 0001,003C,0180,09E8,0000,12BC      ;2696            RC[0D]_D
U 12BC, 0000,003C,3D80,3C00,0000,12BD      ;2697            ID[PSL]_D                   ; SET UP PSL.CC
U 12BD, 0018,0038,61C0,0800,0000,12BE      ;2698            Q_K[.F]
U 12BE, 081D,2000,01C0,0800,0000,1028      ;2699            A[U_Q-D,D_ALU,Q_ALU
U 1028, 0000,1A3D,0180,0800,0000,1080      ;2700    =00     CAL[,PSL.CC?,J/BRTBLE       ; TEST INSTRUCTION
U 1029, 0001,203D,0180,09F0,0000,116E      ;2701            RC[0E]_Q,ERROR1             ; BRANCH WENT TO WRONG ADDRESS
                                           ;2702    ; NOW TEST BEN/2
U 102A, 0018,0038,0580,09E0,0000,102B      ;2703            RC[0C]_K[.1]
U 102B, 0800,003C,0180,0A18,0000,12BF      ;2704            D_R[3]
U 12BF, 0019,0034,0580,0800,0010,12C0      ;2705            A[U_D[AND]K[.1],CLK.UBCC
U 12C0, 0000,013C,0180,0800,0000,1182      ;2706            Z?
U 1182, 0000,003C,0180,0800,0000,12C1      ;2707    =0      J/PSLCC2
U 1183, 0000,023C,0180,0800,0000,1175      ;2708            BEN/ROR                     ; BRANCH (BEN/2) SHOULD NOT ASSERT
U 1175, 0000,003C,0180,0800,0000,1197      ;2709    =101    J/PSLCC3
U 1177, 0000,003D,0180,0800,0000,116E      ;2710            ERROR1                      ; BRANCH WENT TO WRONG ADDRESS
U 12C1, 0000,023C,0180,0800,0000,1195      ;2711    PSLCC2: BEN/ROR                     ; BRANCH (BEN/2) SHOULD ASSERT
U 1195, 0000,003D,0180,0800,0000,116E      ;2712    =101    ERROR1                      ; BRANCH WENT TO WRONG ADDRESS
U 1197, 0000,003C,0180,0A18,0010,12C2      ;2713    PSLCC3: ALU_R[3],CLK.UBCC           ; TRIED ALLL DATA PATTERNS
U 12C2, 0000,013C,0180,0800,0000,1184      ;2714            Z?
U 1184, 0018,0000,0580,0A98,0000,1181      ;2715    =0      R[3]_LA-K[.1],J/PSLCC1      ; IF NOT CONTINUE
U 1185, 0000,003C,0180,0800,0000,1188      ;2716            NOP
```

```
                                             ;2717          .PAGE   "TEST 9C        BEN/1C, CONSOLE MODE, TEST"
                                             ;2718   ;*****************************************************************
                                             ;2719   ;++
                                             ;2720   ; TEST  9C      BEN/1C, CONSOLE MODE, TEST
                                             ;2721   ;
                                             ;2722   ; TEST DESCRIPTION
                                             ;2723   ;       THIS IS A TEST OF THE BEN 1C BIT WHICH IS ASSERTED WHEN NOT
                                             ;2724   ;       IN CONSOLE MODE.
                                             ;2725   ;
                                             ;2726   ; ERROR DESCRIPTION
                                             ;2727   ;       ERROR CODE:
                                             ;2728   ;               0=> BRANCH FAILED TO BE DEASSERTED
                                             ;2729   ;               1=> BRANCH FAILED TO BE ASSERTED
                                             ;2730   ;
                                             ;2731   ;--
                                             ;2732   ;*****************************************************************
                                             ;2733   =0
U 1188, 0000,003D,0180,0800,0000,10BE        ;2734   CONBEN: NEWTST
U 1189, 0018,0038,0580,09F8,0000,118A        ;2735           RC[0F]_K[.1]
U 118A, 0000,003D,0180,0800,0000,1166        ;2736   =0      ERLOOP
U 118B, 0000,003C,0180,1C00,0000,12C3        ;2737           FS/CID,CID/CONT          ; CLEAR CONSOLE MODE
U 12C3, 0000,1C3C,0180,0800,0000,10DB        ;2738           CONSOLE.MODE?            ; TEST INSTRUCTION, BRANCH SHOULD ASSERT
U 10DB, 0018,0039,0580,09F0,0000,116E        ;2739   =11011  ERROR1,RC[0E]_K[.1]      ; BRANCH WENT TO THE WRONG ADDRESS
U 10DF, 0000,003C,0180,0800,0000,118C        ;2740           NOP
U 118C, 0000,003D,0180,0800,0000,1166        ;2741   =0      ERLOOP
U 118D, 0000,003C,0180,1400,0000,12C4        ;2742           FS/CID,CID/ACK           ; SET CONSOLE MODE
U 12C4, 0000,1C3C,0180,0800,0000,10FB        ;2743           CONSOLE.MODE?            ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
U 10FB, 0000,003C,0180,0800,0000,1190        ;2744   =11011  J/CONB1
U 10FF, 0003,003D,0180,09F0,0000,116E        ;2745           ERROR1,RC[0E]_0          ; BRANCH WENT TO THE WRONG ADDRESS
                                             ;2746   =0
U 1190, 0000,003D,0180,0800,0000,1166        ;2747   CONB1:  ERLOOP
U 1191, 0000,003C,0180,1C00,0000,12C5        ;2748           FS/CID,CID/CONT          ; CLEAR CONSOLE MODE
U 12C5, 0000,1C3C,0180,0800,0000,111B        ;2749           CONSOLE.MODE?            ; TEST INSTRUCTION, BRANCH SHOULD ASSERT
U 111B, 0018,0039,0580,09F0,0000,116E        ;2750   =11011  ERROR1,RC[0E]_K[.1]      ; BRANCH WENT TO WRONG ADDRESS
U 111F, 0000,003C,0180,0800,0000,1192        ;2751           NOP
```

```
                                               ;2752           .PAGE   "TEST 9D        BEN/1C, KERNAL MODE, TEST"
                                               ;2753   ;*****************************************************************
                                               ;2754   ;++
                                               ;2755   ; TEST  9D      BEN/1C, KERNAL MODE, TEST
                                               ;2756   ;
                                               ;2757   ; TEST DESCRIPTION
                                               ;2758   ;       THIS IS A TEST OF THE BEN PSL MODE BIT WHICH IS ASSERTED
                                               ;2759   ;       WHEN IN KERNAL MODE (PSL<25:24>=00).
                                               ;2760   ;
                                               ;2761   ; ERROR DESCRIPTION
                                               ;2762   ;       ERROR CODE:
                                               ;2763   ;               BIT <00> = 0 => BRANCH FAILED TO BE DEASSERTED
                                               ;2764   ;               BIT <00> = 1 => BRANCH FAILED TO BE ASSERTED
                                               ;2765   ;               BITS <02:01> = EXPECTED PSL <25:24>
                                               ;2766   ;
                                               ;2767   ;--
                                               ;2768   ;*****************************************************************
                                               ;2769   =0
U 1192, 0000,003D,0180,0800,0000,10BE          ;2770   KMODE:  NEWTST
U 1193, 0018,0038,0580,09F8,0000,12C6          ;2771           RC[OF]_K[.1]
U 12C6, 0F00,003C,0180,0800,0000,12C7          ;2772           D_0
U 12C7, 0000,003C,3D80,3C00,0000,12C8          ;2773           ID[PSL]_D               ; PSL=0
U 12C8, 0000,1C3C,0180,0800,0000,113E          ;2774           PSL.MODE?               ; TEST INSTRUCTION, BRANCH SHOULD ASSERT
U 113E, 0018,0039,0580,09F0,0000,116E          ;2775   =11110  ERROR1,RC[OE]_K[.1]     ; BRANCH WENT TO THE WRONG ADDRESS
U 113F, 0000,003C,0180,0800,0000,1198          ;2776           NOP
U 1198, 0000,003D,0180,0800,0000,1166          ;2777   =0      ERLOOP
U 1199, 0000,003C,7D80,0800,0084,72C9          ;2778           SC_K[.18]
U 12C9, 0803,001C,0180,0800,0000,12CA          ;2779           ALU_NOT.MASK,D_ALU      ; D=1000000
U 12CA, 0000,003C,3D80,3C00,0000,12CB          ;2780           ID[PSL]_D               ; SET PSL<24>
U 12CB, 0000,1C3C,0180,0800,0000,115E          ;2781           PSL.MODE?               ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
U 115E, 0000,003C,0180,0800,0000,119C          ;2782   =11110  J/KMODE1
U 115F, 0018,0039,0980,09F0,0000,116E          ;2783           ERROR1,RC[OE]_K[.2]     ; BRANCH WENT TO THE WRONG ADDRESS
                                               ;2784   =0
U 119C, 0000,003D,0180,0800,0000,1166          ;2785   KMODE1: ERLOOP
U 119D, 0000,003C,B980,0800,0084,72CC          ;2786           SC_K[.19]
U 12CC, 0803,001C,0180,0800,0000,12CD          ;2787           ALU_NOT.MASK,D_ALU      ; D=2000000
U 12CD, 0000,003C,3D80,3C00,0000,12CE          ;2788           ID[PSL]_D               ; SET PSL<25>
U 12CE, 0000,1C3C,0180,0800,0000,117E          ;2789           PSL.MODE?               ; TEST INSTRUCTION, BRANCH SHOULD NOT ASSERT
U 117E, 0000,003C,0180,0800,0000,12CF          ;2790   =11110  J/KMODE2
U 117F, 0018,0039,1180,09F0,0000,116E          ;2791           ERROR1,RC[OE]_K[.4]     ; BRANCH WENT TO THE WRONG ADDRESS
U 12CF, 0000,003C,0180,0800,0000,11A8          ;2792   KMODE2: NOP
```

```
                                           .PAGE   "TEST 9E        BRANCH ENABLE 3 -- ALU C BIT"
                                   ;*******************************************************************
                                   ;++
                                   ; TEST  9E      BRANCH ENABLE 3 -- ALU C BIT
                                   ;
                                   ; TEST DESCRIPTION
                                   ;       THIS TEST CHECKS THAT ALU CARRY 31 IS ENABLED IN BIT POSITION 1
                                   ;       DURING A BRANCH ENABLE 3.
                                   ;
                                   ; LOGIC DESCRIPTION
                                   ;       THIS TEST CHECKS BRANCH MULTIPLEXOR ON THE USC MODULE.
                                   ;
                                   ; ERROR DESCRIPTION
                                   ;       DATA: EXPECTED BRANCH BIT
                                   ;             RECEIVED BRANCH BIT
                                   ;
                                   ; SYNC POINT DESCRIPTION
                                   ;       SYNC05 -- ALU C(31) IS ENABLED ONTO THE UPC
                                   ;       SYNC06 -- ALU C(31) IS ENABLED ONTO THE UPC
                                   ;-
                                   ;**********************************************************************
                                   =0
U 11A8, 0018,0039,0980,09F8,0000,10BE  T002:   NEWTST[.2]
U 11A9, 0F03,003C,0180,09F0,0000,12D0          RC[0E]_0,D_0                     ; SET THE EXPECTED DATA
U 12D0, 0000,003C,3180,3C00,0000,11AC          ID[CES]_D                        ; LOAD THE BRANCH BIT
U 11AC, 0000,003D,0180,0800,0000,1166  =0      ERLOOP
U 11AD, 0000,003C,0180,0800,0000,11B6          NOP
                                   =0
U 11B6, 0F00,033D,0180,0800,0000,11A0  SYNC05: C31?,CALL,J/BEN03,D_0            ; EXECUTE THE BRANCH
U 11B7, 001D,2000,0180,0800,0010,12D1          ALU_Q-D,CLK.UBCC                 ; CHECK THE RESULT
U 12D1, 0000,013C,0180,0800,0000,11B8          Z?
U 11B8, 0001,203D,0180,09E8,0000,1176  =0      ERROR2,RC[0D]_Q                  ; BRANCH FAILED
U 11B9, 0018,0038,0980,09F0,0000,12D2          RC[0E]_K[.2]
U 12D2, 0818,0038,4180,0800,0000,12D3          D_K[.80]
U 12D3, 0000,003C,3180,3C00,0000,11BC          ID[CES]_D                        ; SET THE BRANCH BIT
U 11BC, 0000,003D,0180,0800,0000,1166  =0      ERLOOP
U 11BD, 0000,003C,0180,0800,0000,11C0          NOP
                                   =0
U 11C0, 0818,0339,0980,0800,0000,11A0  SYNC06: C31?,CALL,J/BEN03,D_K[.2]        ; EXECUTE THE BRANCH
U 11C1, 001D,2000,0180,0800,0010,12D4          ALU_Q-D,CLK.UBCC                 ; CHECK THE RESULT
U 12D4, 0000,013C,0180,0800,0000,11C4          Z?
U 11C4, 0001,203D,0180,09E8,0000,1176  =0      ERROR2,RC[0D]_Q                  ; BRANCH FAILED
U 11C5, 0000,003C,0180,0800,0000,12D6          J/ENDT002
                                   =000
U 11A0, 0000,003E,01F8,0800,0000,0001  BEN03:  Q_0,RETURN1
U 11A1, 0018,003A,05C0,0800,0000,0001          Q_K[.1],RETURN1
U 11A2, 0018,003A,09C0,0800,0000,0001          Q_K[.2],RETURN1
U 11A3, 0018,003A,0DC0,0800,0000,0001          Q_K[.3],RETURN1
U 11A4, 0018,003A,11C0,0800,0000,0001          Q_K[.4],RETURN1
U 11A5, 0018,0038,11C0,0800,0000,12D5          Q_K[.4],J/INCREMENTQ
U 11A6, 0018,003A,D5C0,0800,0000,0001          Q_K[.6],RETURN1
U 11A7, 0018,003A,5DC0,0800,0000,0001          Q_K[.7],RETURN1
                                   INCREMENTQ:
U 12D5, 0019,2016,05C0,0800,0000,0001          Q_Q+K[.1],RETURN1
U 12D6, 0000,003C,0180,0800,0000,11C8  ENDT002:NOP
```

```
                                                .PAGE   "TEST 9F       BRANCH ENABLE 1B -- ALU Z BIT"
                                        ;************************************************************************
                                        ;++
                                        ; TEST  9F      BRANCH ENABLE 1B -- ALU Z BIT
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST CHECKS BIT POSITION 2 OF BRANCH ENABLE 1B.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS THE BRANCH MUX ON THE USC MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED BRANCH BITS
                                        ;             RECEIVED BRANCH BITS
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       SYNC07 -- BRANCH BIT IS ASSERTED ON THE UPC
                                        ;       SYNC08 -- BRANCH BIT IS ASSERTED ON THE UPC
                                        ;-
                                        ;************************************************************************
                                        =0
U 11C8, 0018,0039,0980,09F8,0000,10BE   T003:   NEWTST[.2]
U 11C9, 0F03,003C,0180,09F0,0000,12D7           RC[0E]_0,D_0                    ; SET THE EXPECTED DATA
U 12D7, 0000,003C,3180,3C00,0000,11CC           ID[CES]_D                       ; CLEAR THE BRANCH BIT
U 11CC, 0000,003D,0180,0800,0000,1166   =0      ERLOOP
U 11CD, 0000,003C,0180,0800,0000,11DE           NOP
                                        =0
U 11DE, 0F00,1B3D,0180,0800,0000,11C3   SYNC07: ALU.Z?,CALL,J/BEN1B,D_0         ; EXECUTE THE BRANCH
U 11DF, 001D,2000,0180,0800,0010,12D8           ALU_Q-D,CLK.UBCC                ; CHECK THE RESULT
U 12D8, 0000,013C,0180,0800,0000,11E0           Z?
U 11E0, 0001,203D,0180,09E8,0000,1176   =0      ERROR2,RC[0D]_Q                 ; BRANCH FAILED
U 11E1, 0018,0038,1180,09F0,0000,12D9           RC[0E]_K[.4]                    ; SET THE EXPECTED DATA
U 12D9, 0818,0038,4180,0800,0000,12DA           D_K[.80]                        ; GENERATE DATA TO SET THE BIT
U 12DA, 0500,003C,0180,0800,0000,12DB           D_D.LEFT
U 12DB, 0000,003C,3180,3C00,0000,11E2           ID[CES]_D                       ; SET THE BRANCH BIT
U 11E2, 0000,003D,0180,0800,0000,1166   =0      ERLOOP
U 11E3, 0000,003C,0180,0800,0000,11E4           NOP
                                        =0
U 11E4, 0818,1B39,1180,0800,0000,11C3   SYNC08: ALU.Z?,CALL,J/BEN1B,D_K[.4]     ; EXECUTE THE BRANCH
U 11E5, 001D,2000,0180,0800,0010,12DC           ALU_Q-D,CLK.UBCC                ; CHECK THE RESULT
U 12DC, 0000,013C,0180,0800,0000,11E6           Z?
U 11E6, 0001,203D,0180,09E8,0000,1176   =0      ERROR2,RC[0D]_Q                 ; BRANCH FAILED
U 11E7, 0000,003C,0180,0800,0000,12DD           J/ENDT003
                                        =0011
U 11C3, 0000,003E,01F8,0800,0000,0001   BEN1B:  Q_0,RETURN1
U 11C7, 0018,003A,11C0,0800,0000,0001           Q_K[.4],RETURN1
U 11CB, 0018,003A,01C0,0800,0000,0001           Q_K[.8],RETURN1
U 11CF, 0018,003A,85C0,0800,0000,0001           Q_K[.C],RETURN1
U 12DD, 0000,003C,0180,0800,0000,11E8   ENDT003:NOP
```

```
                                                   .PAGE   "TEST A0        ID BUS ADDRESSED BY THE SC"
                                           ;*****************************************************************
                                           ;++
                                           ; TEST  A0       ID BUS ADDRESSED BY THE SC
                                           ;
                                           ; TEST DESCRIPTION
                                           ;       THIS TEST READS THE ID BUS REGISTERS USING THE KMX FIELD AS THE
                                           ;       ADDRESS SOURCE AND COMPARES THE DATA READ WITH THE DATA FROM A READ
                                           ;       OF THE SAME REGISTER WITH THE SC AS THE ADDRESS SOURCE.
                                           ;       SUBTEST 1 - CHECK THE ADDRESSES FROM 3 TO 7
                                           ;       SUBTEST 2 - CHECK THE ADDRESSES FROM 09 TO 10
                                           ;       SUBTEST 3 - CHECK THE ADDRESSES FROM 19 TO 1E
                                           ;       SUBTEST 4 - CHECK THE ADDRESSES FROM 21 TO 3F
                                           ;
                                           ; LOGIC DESCRIPTION
                                           ;       THIS TEST CHECKS THE ID BUS ADDRESS MUX ON THE ICL MODULE.
                                           ;
                                           ; ERROR DESCRIPTION
                                           ;       DATA: EXPECTED ID BUS REGISTER CONTENTS
                                           ;             RECEIVED ID BUS REGISTER CONTENTS
                                           ;             ID BUS REGISTER ADDRESS
                                           ;             LOOP COUNT
                                           ;--
                                           ;******************************************************************
                                           =0
U 11E8, 0018,0039,1180,09F8,0000,10BE      T009:   NEWTST[.4]
U 11E9, 0000,003C,0180,0800,C000,11EA              NOP
                                           ;///////////////////////////////////////////////////////////////
                                           ;+
                                           ; CHECK REGISTERS 03 THRU 07
                                           ;-
U 11EA, 0000,003D,0180,0800,0000,118E      =0      SUBTEST
U 11EB, 0003,003C,0180,0A80,0000,12DE              R[0]_0                          ; INIT ADDRESS COUNTER
U 12DE, 0018,0038,0D80,09E0,0084,72DF              SC_K[.3],RC[0C]_K[.3]           ; INIT THE SC AND TIPEOUT
U 12DF, 0818,0038,1180,0800,0000,12E0              D_K[.4]
U 12E0, 0019,0014,0580,09D8,0000,11EC              RC[0B]_D+K[.1]                  ; SET THE LOOP COUNT
U 11EC, 0000,003D,0180,0800,0000,1166      =0      ERLOOP
U 11ED, 0800,003C,0180,0A00,0000,11EE      LOOP9:  D_R[0]                          ; GET THE BRANCH COUNT
U 11EE, 0000,193D,0180,0800,0000,11B0      =0      D3-0?,CALL,J/IDBUS1             ; READ THE REGISTER WITH THE KMX FIELD
U 11EF, 0001,203C,0180,09F0,0000,12E1              RC[0E]_Q                        ; SAVE DATA
U 12E1, 0810,0038,01F0,2570,0000,12E2              Q_ID(SC),D_RC[0E]               ; READ USING SC AS ADDRESS
U 12E2, 001D,2000,0180,0800,0010,12E3              A[U_Q-D,CLK.UBCC                ; CHECK
U 12E3, 0000,013C,0180,0800,0000,11F0              Z?
U 11F0, 0001,203D,0180,09E8,0000,1176      =0      ERROR2,RC[0D]_Q                 ; SC REFERENCED WRONG REGISTER
U 11F1, 0800,003C,0180,0A00,0000,12E4              D_R[0]
U 12E4, 0019,0014,0580,0A80,0084,92E5              R[0]_D+K[.1],SC_SC+K[.1]        ; SELECT NEXT ADDRESS
U 12E5, 0810,0038,0180,0960,0000,12E6              D_RC[0C]
U 12E6, 0019,0014,0580,09E0,0000,12E7              RC[0C]_D+K[.1]
U 12E7, 0810,0038,0180,0958,0000,12E8              D_RC[0B]
U 12E8, 0019,0000,0580,09D8,0010,12E9              RC[0B]_D-K[.1],CLK.UBCC         ; DECREMENT LOOP COUNT
U 12E9, 0000,013C,0180,0800,0000,11F2              Z?
U 11F2, 0000,003C,0180,0800,0000,11ED      =0      J/LOOP9
U 11F3, 0000,003C,0180,0800,0000,11F4              NOP
                                           ;////////////////////////////////////////////////////////////////
                                           ;+
                                              ;2952    ; CHECK REGISTERS 9 THRU 10
                                              ;2953    ;-
U 11F4, 0000,003D,0180,0800,0000,118E         ;2954    =0        SUBTEST
U 11F5, 0003,003C,0180,0A80,0000,12EA         ;2955              R[0]_0                          ; INIT BRANCH DATA
U 12EA, 0018,0038,D980,09E0,0084,72EB         ;2956              SC_K[.9],RC[0C]_K[.9]           ; INIT THE SC
U 12EB, 0018,0038,0180,09D8,0000,11F6         ;2957              RC[0B]_K[.8]                    ; SET THE LOOP COUNT
U 11F6, 0000,003D,0180,0800,0000,1166         ;2958    =0        ERLOOP
U 11F7, 0800,003C,0180,0A00,0000,11F8         ;2959    LOOP9A:   D_R[0]                          ; GET BRANCH INDEX
U 11F8, 0000,193D,0180,0800,0000,11D0         ;2960    =0        D3-0?,CALL,J/IDBUS2             ; READ THE REGISTER WITH THE KMX FIELD
U 11F9, 0001,203C,0180,09F0,0000,12EC         ;2961              RC[0E]_Q
U 12EC, 0810,0038,01F0,2570,0000,12ED         ;2962              Q_ID(SC),D_RC[0E]               ; READ WITH THE SC
U 12ED, 001D,2000,0180,0800,0010,12EE         ;2963              ALU_Q-D,CLK.UBCC                ; CHECK
U 12EE, 0000,013C,0180,0800,0000,11FA         ;2964              Z?
U 11FA, 0001,203D,0180,09E8,0000,1176         ;2965    =0        ERROR2,RC[0D]_Q                 ; SC ADDRESSED WRONG REGISTER
U 11FB, 0800,003C,0180,0A00,0000,12EF         ;2966              D_R[0]
U 12EF, 0019,0014,0580,0A80,0000,12F0         ;2967              R[0]_D+K[.1]                    ; INCREMENT BRANCH INDEX
U 12F0, 0810,0038,0180,0960,0000,12F1         ;2968              D_RC[0C]
U 12F1, 0019,0014,0580,09E0,0084,92F2         ;2969              RC[0C]_D+K[.1],SC_SC+K[.1]      ; SELECT NEXT ADDRESS
U 12F2, 0810,0038,0180,0958,0000,12F3         ;2970              D_RC[0B]
U 12F3, 0019,0000,0580,09D8,0010,12F4         ;2971              RC[0B]_D-K[.1],CLK.UBCC         ; CHECK THE LOOP COUNT
U 12F4, 0000,013C,0180,0800,0000,11FC         ;2972              Z?
U 11FC, 0000,003C,0180,0800,0000,11F7         ;2973    =0        J/LOOP9A
U 11FD, 0000,003C,0180,0800,0000,11FE         ;2974              NOP
                                              ;2975    ;//////////////////////////////////////////////////////////////////////
                                              ;2976    ;+
                                              ;2977    ; CHECK REGISTERS 19 THRU 1E
                                              ;2978    ;-
U 11FE, 0000,003D,0180,0800,0000,118E         ;2979    =0        SUBTEST
U 11FF, 0003,003C,0180,0A80,0000,12F5         ;2980              R[0]_0
U 12F5, 0818,0038,7D80,0800,0000,12F6         ;2981              D_K[.18]
U 12F6, 0019,0014,0580,09E0,0082,12F7         ;2982              ALU_D+K[.1],SC_ALU,RC[0C]_ALU   ; INIT THE SC ADDRESS
U 12F7, 0018,0038,D580,09D8,0000,1200         ;2983              RC[0B]_K[.6]                    ; SET THE LOOP COUNT
U 1200, 0000,003D,0180,0800,0000,1166         ;2984    =0        ERLOOP
U 1201, 0800,003C,0180,0A00,0000,1202         ;2985    LOOP9B:   D_R[0]                          ; GET THE BRANCH INDEX
U 1202, 0000,193D,0180,0800,0000,11D8         ;2986    =0        D3-0?,CALL,J/IDBUS3             ; READ, USING THE KMX FIELD
U 1203, 0001,203C,0180,09F0,0000,12F8         ;2987              RC[0E]_Q
U 12F8, 0810,0038,01F0,2570,0000,12F9         ;2988              Q_ID(SC),D_RC[0E]               ; READ, USING SC
U 12F9, 001D,2000,0180,0800,0010,12FA         ;2989              ALU_Q-D,CLK.UBCC                ; CHECK
U 12FA, 0000,013C,0180,0800,0000,1204         ;2990              Z?
U 1204, 0001,203D,0180,09E8,0000,1176         ;2991    =0        ERROR2,RC[0D]_Q                 ; SC ADDRESSED WRONG REGISTER
U 1205, 0800,003C,0180,0A00,0000,12FB         ;2992              D_R[0]
U 12FB, 0019,0014,0580,0A80,0000,12FC         ;2993              R[0]_D+K[.1]
U 12FC, 0810,0038,0180,0960,0000,12FD         ;2994              D_RC[0C]
U 12FD, 0019,0014,0580,09E0,0084,92FE         ;2995              RC[0C]_D+K[.1],SC_SC+K[.1]
U 12FE, 0810,0038,0180,0958,0000,12FF         ;2996              D_RC[0B]
U 12FF, 0019,0000,0580,09D8,0010,1300         ;2997              RC[0B]_D-K[.1],CLK.UBCC
U 1300, 0000,013C,0180,0800,0000,1206         ;2998              Z?
U 1206, 0000,003C,0180,0800,0000,1201         ;2999    =0        J/LOOP9B
U 1207, 0000,003C,0180,0800,0000,1208         ;3000              NOP
                                              ;3001    ;//////////////////////////////////////////////////////////////////////
                                              ;3002    ;+
                                              ;3003    ; CHECK ADDRESSES 21 THRU 23
                                              ;3004    ;-
U 1208, 0000,003D,0180,0800,0000,118E         ;3005    =0        SUBTEST
U 1209, 0003,003C,0180,0A80,0000,1301         ;3006              R[0]_0
```

```
U 1301, 0818,0038,7580,0800,0000,1302   ;3007             D_K[.20]
U 1302, 0019,0014,0580,09E0,0082,1303   ;3008             RC[OC]_D+K[.1],SC_ALU           ; INIT THE SC
U 1303, 0018,0038,0D80,09D8,0000,120A   ;3009             RC[OB]_K[.3]                    ; INIT THE LOOP COUNT
U 120A, 0000,003D,0180,0800,0000,1166   ;3010   =0        ERLOOP
U 120B, 0800,003C,0180,0A00,0000,120C   ;3011   LOOP9C:   D_R[0]
U 120C, 0000,193D,0180,0800,0000,1038   ;3012   =0        D3-0?,CALL,J/IDBUS4             ; READ, USING THE KMX FIELD
U 120D, 0001,203C,0180,09F0,0000,1304   ;3013             RC[OE]_Q
U 1304, 0810,0038,01F0,2570,0000,1305   ;3014             Q_ID(SC),D_RC[OE]               ; READ, USING THE SC
U 1305, 001D,2000,0180,0800,0010,1306   ;3015             ALU_Q-D,CLK.UBCC                ; CHECK
U 1306, 0000,013C,0180,0800,0000,120E   ;3016             Z?
U 120E, 0001,203D,0180,09E8,0000,1176   ;3017   =0        ERROR2,RC[OD]_Q                 ; SC ADDRESSES WRONG REGISTER
U 120F, 0800,003C,0180,0A00,0000,1307   ;3018             D_R[0]
U 1307, 0019,0014,0580,0A80,0000,1308   ;3019             R[0]_D+K[.1]
U 1308, 0810,0038,0180,0960,0000,1309   ;3020             D_RC[OC]
U 1309, 0019,0014,0580,09E0,0084,930A   ;3021             RC[OC]_D+K[.1],SC_SC+K[.1]
U 130A, 0810,0038,0180,0958,0000,130B   ;3022             D_RC[OB]
U 130B, 0019,0000,0580,09D8,0010,130C   ;3023             RC[OB]_D-K[.1],CLK.UBCC         ; CHECK LOOP COUNT
U 130C, 0000,013C,0180,0800,0000,1210   ;3024             Z?
U 1210, 0000,003C,0180,0800,0000,120B   ;3025   =0        J/LOOP9C
U 1211, 0000,003C,0180,0800,0000,130D   ;3026             J/END009
                                        ;3027   =000
U 11B0, 0000,003E,0DF0,2C00,0000,0001   ;3028   IDBUS1:   Q_ID[SYS.ID],RETURN1
U 11B1, 0000,003E,11F0,2C00,0000,0001   ;3029             Q_ID[RXCS],RETURN1
U 11B2, 0000,003E,15F0,2C00,0000,0001   ;3030             Q_ID[RXDB],RETURN1
U 11B3, 0000,003E,19F0,2C00,0000,0001   ;3031             Q_ID[TXCS],RETURN1
U 11B4, 0000,003E,1DF0,2C00,0000,0001   ;3032             Q_ID[TXDB],RETURN1
                                        ;3033   =
                                        ;3034   =000
U 11D0, 0000,003E,25F0,2C00,0000,0001   ;3035   IDBUS2:   Q_ID[NXT.PER],RETURN1
U 11D1, 0000,003E,29F0,2C00,0000,0001   ;3036             Q_ID[CLK.CS],RETURN1
U 11D2, 0000,003E,2DF0,2C00,0000,0001   ;3037             Q_ID[INTERVAL],RETURN1
U 11D3, 0000,003E,31F0,2C00,0000,0001   ;3038             Q_ID[CES],RETURN1
U 11D4, 0000,003E,35F0,2C00,0000,0001   ;3039             Q_ID[VECTOR],RETURN1
U 11D5, 0000,003E,39F0,2C00,0000,0001   ;3040             Q_ID[SIR],RETURN1
U 11D6, 0000,003E,3DF0,2C00,0000,0001   ;3041             Q_ID[PSL],RETURN1
U 11D7, 0000,003E,41F0,2C00,0000,0001   ;3042             Q_ID[TBUF],RETURN1
                                        ;3043   =000
U 11D8, 0000,003E,65F0,2C00,0000,0001   ;3044   IDBUS3:   Q_ID[SBI.ERR],RETURN1
U 11D9, 0000,003E,69F0,2C00,0000,0001   ;3045             Q_ID[TIME.ADDR],RETURN1
U 11DA, 0000,003E,6DF0,2C00,0000,0001   ;3046             Q_ID[FAULT],RETURN1
U 11DB, 0000,003E,71F0,2C00,0000,0001   ;3047             Q_ID[COMP],RETURN1
U 11DC, 0000,003E,75F0,2C00,0000,0001   ;3048             Q_ID[MAINT],RETURN1
U 11DD, 0000,003E,79F0,2C00,0000,0001   ;3049             Q_ID[PARITY],RETURN1
                                        ;3050   =
                                        ;3051   =00
U 1038, 0000,003E,85F0,2C00,0000,0001   ;3052   IDBUS4:   Q_ID[UBREAK],RETURN1
U 1039, 0000,003E,89F0,2C00,0000,0001   ;3053             Q_ID[WCS.ADDR],RETURN1
U 103A, 0000,003E,8DF0,2C00,0000,0001   ;3054             Q_ID[WCS.DATA],RETURN1
                                        ;3055   =
U 130D, 0000,003C,0180,0800,0000,130E   ;3056   END009:   NOP
U 130E, 0000,003D,0180,0800,0000,10BE   ;3057   ENDTST:   NEWTST
```

```
;Location       0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 0000 - OFFF Unused
U 1000          1871:   1838    2252=   2253=   1845=   1861=   2254=   2255=
U 1008          2163=   2164=   2165=   2166=   1862=   1863=   2224=   2225=
U 1010          1971=   1972=   2261=   2262=   1974=   1975=   2263=   2264=
U 1018          2196=   2197=   2198=   2199=   2017=   2018=   2229=   2230=
U 1020          2021=   2022=   2270=   2271=   2033=   2034=   2272=   2273=
U 1028          2700=   2701=   2703=   2704=   2119=   2120=   1839    2505=
U 1030          2122=   2123=   2279=   2280=   2125=   2126=   2281=   2282=
U 1038          3052=   3053=   3054=   1840    2130=   2131=   1841    2506=
U 1040          2133=   2134=   2136=   2137=   2302=   2303=   2304=   2305=
U 1048          2154=   2155=   2157=   2158=   2167=   2168=   1902:   2509=
U 1050          2185    2186=   2189=   2190=   2311=   2312=   2313=   2314=
U 1058          2203=   2204=   1905:   1842    2220=   2221=   1908:   2510=
U 1060          1952=   1953=   1954=   1955=   1956=   1957=   1958=   1959=
U 1068          1960=   1961=   1962=   1963=   1964=   1965=   1966=   1967=
U 1070          2246=   2247=   2248=   2249=   2320=   2321=   2322=   2323=
U 1078          2257=   2258=   2266=   2267=   1843    2578=   1844    2579=
U 1080          2000=   2001=   2002=   2003=   2004=   2005=   2006=   2007=
U 1088          2008=   2009=   2010=   2011=   2012=   2013=   2014=   2015=
U 1090          2275=   2276=   2298=   2299=   2329=   2330=   2331=   2332=
U 1098          2307=   2308=   2316=   2317=   1864    2585=   1865    2586=
U 10A0          2045=   2046=   2047=   2048=   2049=   2050=   2051=   2052=
U 10A8          2053=   2054=   2055=   2056=   2057=   2058=   2059=   2060=
U 10B0          1866    2362=   1867    2363=   1868    2364=   1869    2365=
U 10B8          2325=   2326=   2352=   2353=   1870    2593=   1880    2594=
U 10C0          2063=   2064=   2065=   2066=   2067=   2068=   2069=   2070=
U 10C8          2071=   2072=   2073=   2074=   2075=   2076=   2077=   2078=
U 10D0          1881    2375=   1882    2376=   1883    2377=   1884    2378=
U 10D8          2354=   2355=   1885    2739=   2359=   2360=   1886    2740=
U 10E0          2082=   2083=   2084=   2085=   2086=   2087=   2088=   2089=
U 10E8          2090=   2091=   2092=   2093=   2094=   2095=   2096=   2097=
U 10F0          1887    2389=   1888    2390=   1889    2391=   1890    2392=
U 10F8          2369=   2370=   1891    2744=   2372=   2373=   1892    2745=
U 1100          1825:   1826:   1827:   1828:   1829:   1830:   1831:   1832:
U 1108          1833:   1893    2382=   2383=   1834:   1835:   1836:   1837:
U 1110          2386=   2387=   2446=   2447=   2396=   2397=   2448=   2449=
U 1118          2421=   2422=   1894    2750=   2424=   2425=   1895    2751=
U 1120          2100=   2101=   2102=   2103=   2104=   2105=   2106=   2107=
U 1128          2108=   2109=   2110=   2111=   2112=   2113=   2114=   2115=
U 1130          2426=   2427=   2453=   2454=   2432=   2433=   2455=   2456=
U 1138          2437=   2438=   2441=   2442=   2459=   2460=   2775=   2776=
U 1140          2477=   2478=   2492=   2493=   2499=   2500=   1896    2537=
U 1148          2502=   2504=   2513=   2514=   2532=   2533=   1897    2538=
U 1150          2540=   2541=   2548=   2549=   1898    1928:   2496=   2497=
U 1158          2573=   2574=   2580=   2581=   2588=   2589=   2782=   2783=
U 1160          2621=   2622=   2623=   2624=   2629=   2630=   1899    2545=
U 1168          2634=   2635=   2640=   2641=   2648=   2649=   1900    2546=
U 1170          2651=   2652=   2658=   2659=   1901    2709=   1903    2710=
U 1178          2660=   2661=   2667=   2668=   2690=   2691=   2790=   2791=
U 1180          2692=   2693=   2707=   2708=   2715=   2716=   1904    2553=
U 1188          2734=   2735=   2736=   2737=   2741=   2742=   1936    2554=
U 1190          2747=   2748=   2770=   2771=   1937    2712=   1943    2713=
U 1198          2777=   2778=   1944    2626=   2785=   2786=   1945    2627=
;Location       0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0          2837=   2838=   2839=   2840=   2841=   2842=   2843=   2844=
U 11A8          2815=   2816=   1947    2632=   2818=   2819=   1948    2633=
U 11B0          3028=   3029=   3030=   3031=   3032=   1949    2821=   2822=
U 11B8          2824=   2825=   1950    2637=   2828=   2829=   1968    2638=
U 11C0          2831=   2832=   1969    2892=   2834=   2835=   1973    2893=
U 11C8          2869=   2870=   1976    2894=   2872=   2873=   1977    2895=
U 11D0          3035=   3036=   3037=   3038=   3039=   3040=   3041=   3042=
U 11D8          3044=   3045=   3046=   3047=   3048=   3049=   2875=   2876=
U 11E0          2878=   2879=   2883=   2884=   2886=   2887=   2889=   2890=
U 11E8          2922=   2923=   2928=   2929=   2933=   2934=   2935=   2936=
U 11F0          2940=   2941=   2948=   2949=   2954=   2955=   2958=   2959=
U 11F8          2960=   2961=   2965=   2966=   2973=   2974=   2979=   2980=
U 1200          2984=   2985=   2986=   2987=   2991=   2992=   2999=   3000=
U 1208          3005=   3006=   3010=   3011=   3012=   3013=   3017=   3018=
U 1210          3025=   3026=   1978    1979    1980    1981    1982    1983
U 1218          1984    1985    1986    1987    1988    1989    1990    1991
U 1220          1992    1993    1994    1995    2016    2023    2024    2025
U 1228          2026    2027    2028    2029    2030    2035    2036    2037
U 1230          2038    2039    2040    2041    2042    2124    2135    2156
U 1238          2159    2160    2161    2162    2187    2188    2191    2192
U 1240          2193    2194    2195    2200    2201    2202    2222    2223
U 1248          2226    2227    2228    2250    2251    2259    2260    2268
U 1250          2269    2277    2278    2300    2301    2309    2310    2318
U 1258          2319    2327    2328    2356    2357    2361    2366    2367
U 1260          2368    2374    2379    2380    2381    2384    2388    2393
U 1268          2394    2395    2423    2428    2429    2430    2431    2434
U 1270          2435    2436    2439    2440    2444    2445    2451    2452
U 1278          2457    2458    2479    2480    2481    2482    2483    2484
U 1280          2485    2486    2487    2488    2489    2490    2491    2494
U 1288          2495    2498    2501    2508    2511    2512    2534    2535
U 1290          2536    2542    2543    2544    2550    2551    2552    2555
U 1298          2575    2576    2577    2582    2583    2584    2590    2591
U 12A0          2592    2595    2596    2625    2631    2636    2639    2642
U 12A8          2643    2644    1929:   2645    2646    2647    2653    2654
U 12B0          2655    2656    2657    2662    2663    2664    2665    2666
U 12B8          2669    2694    2695    2696    2697    2698    2699    2705
U 12C0          2706    2711    2714    2738    2743    2749    2772    2773
U 12C8          2774    2779    2780    2781    2787    2788    2789    2792
U 12D0          2817    2823    2826    2827    2833    2846    2847    2871
U 12D8          2877    2880    2881    2882    2888    2896    2930    2931
U 12E0          2932    2937    2938    2939    2942    2943    2944    2945
U 12E8          2946    2947    2956    2957    2962    2963    2964    2967
U 12F0          2968    2969    2970    2971    2972    2981    2982    2983
U 12F8          2988    2989    2990    2993    2994    2995    2996    2997
U 1300          2998    3007    3008    3009    3014    3015    3016    3019
U 1308          3 20    3021    3022    3023    3024    3056    3057
U 1310 - 13EF Unused
U 13F0          1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8          1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH26        799

Used             799
Remaining

Total microwords used in memory U: 799
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH26.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 1806  MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2231  TEST A1 VAMX/VA, PAMX/VAMX, PA BUS AND TIME.OUT.ADDR REG TEST
; 2338  TEST A2 VAMX IN COMPATIBILITY MODE TEST
; 2448  TEST A3 MSC/INHIBIT COMPATIBILITY MODE TEST USING THE VAMX
; 2491  TEST A4 TB WRITE PULSE LOGIC TEST
; 3232  TEST A5 DATA PATH TO AND FROM DATA MEMORY TEST
```

```
;1        .NOLIST
;1804     .LIST
;1805
```

```
                                                 .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                         .REGION/1000,13FF
                                         ;+
                                         ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                         ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                         ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                         ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                         ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                         ;
                                         ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                         ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                         ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                         ;       R[OF] AND DO A RETURNO.
                                         ;
                                         ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                         ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                         ; TO THE CONSOLE.
                                         ;
                                         ;-
U 1100, 0000,003C,1980,0800,0084,7003    1100:   SC_K[ZERO],J/TRPH1        ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001    1101:   SC_K[.1],J/TRPH0          ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001    1102:   SC_K[.2],J/TRPH0          ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001    1103:   SC_K[.3],J/TRPH0          ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001    1104:   SC_K[.4],J/TRPH0          ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001    1105:   SC_K[.6],J/TRPH0          ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001    1106:   SC_K[.9],J/TRPH0          ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001    1107:   SC_K[.7],J/TRPH0          ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001    1108:   SC_K[.8],J/TRPH0          ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003    110C:   SC_K[.C],J/TRPH1          ; RDS
U 110D, 0000,003C,8980,0800,0084,7003    110D:   SC_K[.D],J/TRPH1          ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001    110E:   SC_K[.10],J/TRPH0         ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003    110F:   SC_K[.F],J/TRPH1          ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,1006    TRPH0:  Q_ID[USTACK]
U 1006, 0C00,003C,01E0,0800,0000,100E            Q_D,D_Q
U 100E, 0000,003C,8180,3C00,0000,1016            ID[USTACK]_D
U 1016, 0C00,003C,01E0,0800,0000,101E            Q_D,D_Q
U 101E, 0000,003C,01C0,0A78,0000,1026            Q_R[OF]
U 1026, 0001,2024,0180,0800,0010,102E            A[U_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 102E, 0000,013C,0180,0800,0000,1002            Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000    =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
                                         ;+
                                         ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                         ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                         ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                         ;
                                         ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                         ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                         ;             FAULT STATUS REGISTER
                                         ;             SBI ERROR REGISTER
                                         ;             TIMEOUT ADDRESS REGISTER
                                         ;             MAINTENANCE REGISTER
                                         ;             CACHE PARITY REGISTER
                                         ;             TB ERROR REGISTER 1
                                         ;             TB ERROR REGISTER 0
                                         ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,1004   ;1861   TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,721F   ;1862   =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,1036   ;1863           Q_ID[TBER0]
U 1036, 0001,203C,4DF0,2DB0,0000,103E   ;1864           RC[6]_Q,Q_ID[TBER1]
U 103E, 0001,203C,65F0,2DB8,0000,1046   ;1865           RC[7]_Q,Q_ID[SBI.ERR]
U 1046, 0001,203C,6DF0,2DD8,0000,1056   ;1866           RC[0B]_Q,Q_ID[FAULT]
U 1056, 0001,203C,75F0,2DE0,0000,105B   ;1867           RC[0C]_Q,Q_ID[MAINT]
U 105B, 0001,203C,79  ,2DC8,0000,1066   ;1868           RC[9]_Q,Q_ID[PARITY]
U 1066, 0001,203C,69F0,2DC0,0000,106E   ;1869           RC[8]_Q,Q_ID[TIME.ADDR]
U 106E, 0001,203C,81F0,2DD0,0000,1000   ;1870           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1219   ;1871   1000:   RC[0E]_Q,ERROR1
                                        ;1872   ;+
                                        ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1875   ;               NEWTST
                                        ;1876   ;               ERLOOP
                                        ;1877   ;               ERROR1
                                        ;1878   ;               ERROR2
                                        ;1879   ;
U 1076, 0000,003C,65F8,0800,0084,707E   ;1880   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 107E, 0818,0038,8D80,0800,0000,1109   ;1881           D_K[.1F]                        ; ...
U 1109, 0D00,003C,0180,0800,0000,1154   ;1882           D_DAL.SC
U 1154, 0000,003C,3D80,3C00,0000,1209   ;1883           ID[PSL]_D                       ; WRITE THE PSL
U 1209, 0818,0038,0580,0800,0000,120A   ;1884           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 120A, 0D00,003C,0180,0800,0000,120B   ;1885           D_DAL.SC
U 120B, 0F00,003C,3180,3C00,0000,120C   ;1886           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 120C, 0000,003C,5D80,3C00,0000,120D   ;1887           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 120D, 0000,003C,3980,3C00,0000,120E   ;1888           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 120E, 0000,003C,2980,3C00,0000,120F   ;1889           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 120F, 0000,003C,4980,3C00,0000,1210   ;1890           ID[TBER0]_D                     ; SHUT OFF THE TB
U 1210, 0818,0038,C180,0800,0000,1211   ;1891           D_K[.FFFF]
U 1211, 0000,003C,6580,3C00,0000,1212   ;1892           ID[SBI.ERR]_D
U 1212, 0F00,003C,6D80,3C00,0000,1213   ;1893           ID[FAULT]_D,D_0
U 1213, 0000,003C,6D80,3C00,0000,1214   ;1894           ID[FAULT]_D
U 1214, 0000,003C,6580,3C00,0000,1215   ;1895           ID[SBI.ERR]_D
U 1215, 0003,003C,0180,09F0,0000,1216   ;1896           RC[0E]_0
U 1216, 0003,003C,0180,0AF8,0000,1217   ;1897           R[0F]_0
U 1217, 0003,003C,0180,09E8,0000,105E   ;1898           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 1218, 0818,0038,0980,0800,0000,105E   ;1899   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 1219, 0810,0038,0180,0978,0000,121A   ;1900   ERROR1: D_RC[0F]
U 121A, 0819,0034,4D80,0800,0000,104E   ;1901           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1902   104E:   D_D.OR.K[.4],J/CALLCON
U 121B, 0810,0038,0180,0978,0000,121C   ;1903   ERROR2: D_RC[0F]
U 121C, 0819,0034,4D80,0800,0000,105A   ;1904           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1905   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1906   105E:
                                        ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1908           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1909   ;+
                                        ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1912   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1913   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1914   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1915   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,121D   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 121D, 0810,0038,4D80,0978,0000,121E   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 121E, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 121F, 0010,0038,01C0,0978,0000,1220   ;1943   SETRCF: Q_RC[OF]
U 1220, 0019,2034,4DC0,0800,0000,1221   ;1944           Q_Q.AND.K[.FF00]
U 1221, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946   ; THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
                                        ;1947   ; AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
                                        ;1948   ; UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
                                        ;1949   ; ARE LOST.
U 1222, 0F18,0038,C1F8,0800,0000,100C   ;1950   CSOFF:  D_0,Q_0,ALU_K[.FFFF]
U 100C, 0500,003D,0380,0800,0000,1266   ;1951   =C      D_D.LEFT,SI77,CALL,J/DC9
U 100D, 0000,003C,8580,0800,0084,7223   ;1952           SC_K[.C]
U 1223, 0D00,003C,0180,0800,0000,1224   ;1953           D_DAL.SC
U 1224, 0000,003E,7580,3C00,0000,0001   ;1954           ID[MAINT]_D,RETURN1
                                        ;1955   ; THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
                                        ;1956   ; BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.
U 1225, 0818,0038,0DF8,0800,0000,1226   ;1957   COFF:   D_K[.3],Q_0
U 1226, 0000,003C,6180,0800,0084,7227   ;1958           SC_K[.F]
U 1227, 0D00,003C,0180,0800,0000,1228   ;1959           D_DAL.SC
U 1228, 0000,003E,7580,3C00,0000,0001   ;1960           ID[MAINT]_D,RETURN1
                                        ;1961   ; THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
                                        ;1962   ; APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.
U 1229, 0000,003C,8580,0800,0084,722A   ;1963   SOFF:   SC_K[.C]
U 122A, 0803,001C,0180,0800,0000,122B   ;1964           ALU_NOT.MASK,D_ALU
U 122B, 0000,003E,7580,3C00,0000,0001   ;1965           ID[MAINT]_D,RETURN1
                                        ;1966   ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                        ;1967   ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                        ;1968   ; CERTAIN TRAPS.
                                        ;1969   =0
U 1014, 0000,003D,0180,0800,0000,126A   ;1970   DC.DE:  CALL,J/DCD
```

```
U 1015, 0000,003C,0180,0800,0000,101C   ;1971                NOP
U 101C, 0000,003D,0180,0800,0000,126B   ;1972   =0           CALL,J/DCE
U 101D, 0000,003E,0180,0800,0000,0001   ;1973                RETURN1
                                        ;1974   ; THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
                                        ;1975   ; IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
                                        ;1976   ; VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
                                        ;1977   ; MME WILL BE SET HERE. UPON RETURN THE CONTENTS
                                        ;1978   ; OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
                                        ;1979   ; D AND Q ARE LOST.
                                        ;1980   ; THIS ROUTINE WRITES GROUP 1
                                        ;1981   =0
U 1024, 0F00,003D,0180,0800,0000,1265   ;1982   TBWR1:  D_0,CALL,J/DC8
U 1025, 0100,003C,0180,0800,0000,102C   ;1983   TBWR:   D_D.LEFT2,SI/ZERO
U 102C, 0100,003D,0180,0800,0000,125D   ;1984   =0      D_D.LEFT2,SI/ZERO,CALL,J/DC0
U 102D, 0100,003C,0180,0800,0000,1034   ;1985           D_D.LEFT2,SI/ZERO
U 1034, 0100,003D,0180,0800,0000,125E   ;1986   =0      D_D.LEFT2,SI/ZERO,CALL,J/DC1
U 1035, 0800,003C,4980,3E40,0000,122C   ;1987   TBWRA:  ID[TBER0]_D,D_R[8]
U 122C, 0000,003C,4180,3C00,0000,122D   ;1988           ID[TBUF]_D
U 122D, 0000,003E,4DF0,2C00,0000,0001   ;1989           Q_ID[TBER1],RETURN1
                                        ;1990   ; ROUTINE TO WRITE GROUP 0
                                        ;1991   =0
U 103C, 0F00,003D,0180,0800,0000,1261   ;1992   TBWR0:  D_0,CALL,J/DC4
U 103D, 0000,003C,0180,0800,0000,1025   ;1993           J/TBWR
                                        ;1994   ; ROUTINE TO WRITE BOTH GROUP 0 AND 1
                                        ;1995   =0
U 1044, 0F00,003D,0180,0800,0000,1265   ;1996   TBWRB:  D_0,CALL,J/DC8
U 1045, 0500,003C,0180,0800,0000,1025   ;1997           D_D.LEFT,SI/ZERO,J/TBWR
                                        ;1998   ; THIS ROUTINE WRITES THE TB RANDOMLY.
U 122E, 0818,0038,0580,0800,0000,1035   ;1999   TBWRAN: D_K[.1],J/TBWRA
                                        ;2000   ; THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
                                        ;2001   ; THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
                                        ;2002   ; R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
                                        ;2003   ; TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
                                        ;2004   ; R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
                                        ;2005   =0
U 1048, 0800,003D,0180,0A30,0000,125D   ;2006   RELSUB: D_R[6],CALL,J/DC0
U 1049, 0500,003C,D980,0A28,0084,704A   ;2007           D_D.LEFT,SI/ZERO,SC_K[.9],LAB_R[5]
U 104A, 0003,0011,01C0,0800,0000,125D   ;2008   =0      ALU_MASK+1,Q_ALU,CALL,J/DC0
U 104B, 001C,0024,01C0,0800,0000,122F   ;2009           ALU_LA[ANDNOT]Q,Q_ALU
U 122F, 081D,0030,0180,0800,0000,1230   ;2010           ALU_D[OR]Q,D_ALU
U 1230, 0200,003C,0180,0800,0000,1231   ;2011           D_D.RIGHT2,SI/ZERO
U 1231, 0001,003E,0180,0AB8,0000,0001   ;2012           R[7]_D,RETURN1
                                        ;2013   ; THIS SUBROUTINE IS CALLED TO RELOCATE THE VA, GET THE
                                        ;2014   ; TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
                                        ;2015   ; RETURN3 IF THEY ARE EQUAL; RETURN 2 IF THEY ARE NOT EQUAL;
                                        ;2016   ; AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
                                        ;2017   ; INDICATED IN R[E].
U 1232, 0000,003C,0180,0A70,0000,104C   ;2018   RELCHK: LAB_R[0E]
U 104C, 0000,003D,0180,0800,0000,1218   ;2019   =0      ERLOOP
U 104D, 0000,003C,0180,52F8,0000,1233   ;2020           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERNCE
U 1233, 0800,003C,69F0,2E78,0000,1234   ;2021           Q_ID[TIME.ADDR],D_R[0F]
U 1234, 0018,0038,1980,0AF8,0000,1235   ;2022           ALU_0(K),R[0F]_ALU
U 1235, 0000,003C,0180,0A70,0000,1236   ;2023           LAB_R[0E]
U 1236, 001C,2000,0180,0800,0010,1237   ;2024           ALU_LA[A-B]D,CLK.UBCC           ; SEE IF A TRAP OCCURRED.
U 1237, 0000,013C,0180,0800,0000,1050   ;2025           Z?
```

```
U 1050, 0001,003C,0180,09C8,0000,1240    ;2026   =0      RC[9]_D,J/TBTRUE          ; TRAPPED SO RETURN1.
U 1051, 0000,003C,0180,0800,0000,1052    ;2027           NOP
U 1052, 0F00,003D,0180,0800,0000,126B    ;2028   =0      D_0,CALL,J/DCE                    ; MASK OFF THE UPPER 4 BITS
U 1053, 0500,003C,0180,0800,0000,1238    ;2029           D_D.LEFT,SI/ZERO
U 1238, 0001,003C,0180,0800,0082,1239    ;2030           SC_D
U 1239, 0803,0010,0180,0800,0000,123A    ;2031           ALU_MASK+1,D_ALU
U 123A, 001D,2024,01C0,0800,0000,123B    ;2032           ALU_Q[ANDNOT]D,Q_ALU
U 123B, 0800,003C,0180,0A38,0000,123C    ;2033           D_R[7]                            ; SEE IF ADDRESS RELOCATED
U 123C, 0001,003C,0180,09E0,0000,123D    ;2034           RC[0C]_D
U 123D, 0001,203C,0180,09D8,0000,123E    ;2035           RC[0B]_Q
U 123E, 001D,2000,0180,0800,0010,123F    ;2036           ALU_Q-D,CLK.UBCC                  ; PROPERLY.
U 123F, 0000,013C,0180,0800,0000,1054    ;2037           Z?
U 1054, 0000,003E,0180,0800,0000,0002    ;2038   =0      RETURN2                           ; INCORRECT.
U 1055, 0000,003E,0180,0800,0000,0003    ;2039           RETURN3                           ; OK
U 1240, 0000,003C,4DF0,2C00,0000,1241    ;2040   TBTRUE: Q_ID[TBER1]
U 1241, 0001,203E,0180,09F0,0000,0001    ;2041           RC[0E]_Q,RETURN1
                                         ;2042   ; THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
                                         ;2043   ; IF NO TRAP OCCURS WHEN THE REFERNCE IS MADE EXECUTE A RETURN1.
                                         ;2044   ; IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
                                         ;2045   ; A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
U 1242, 0000,003C,0180,0A70,0000,1058    ;2046   MISS:   LAB_R[0E]
U 1058, 0000,003D,0180,0800,0000,1218    ;2047   =0      ERLOOP
U 1059, 0000,003C,0180,52F8,0000,1243    ;2048           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
U 1243, 0800,003C,0180,0A78,0000,1244    ;2049           D_R[0F]
U 1244, 0018,0038,1980,0AF8,0000,1245    ;2050           A[U_0(K),R[0F]_ALU
U 1245, 0000,003C,0180,0A70,0000,1246    ;2051           LAB_R[0E]
U 1246, 0001,003C,0180,09C8,0000,1247    ;2052           RC[9]_D
U 1247, 001C,2000,0180,0800,0010,1248    ;2053           ALU_LA[A-B]D,CLK.UBCC             ; SEE IF A TRAP OCCRRED.
U 1248, 0000,013C,0180,0800,0000,105C    ;2054           Z?
U 105C, 0000,003C,0180,0800,0000,1249    ;2055   =0      J/MISSA
U 105D, 0000,003E,0180,0800,0000,0001    ;2056           RETURN1                           ; NO TRAP SO RETURN1.
U 1249, 0000,003C,D580,0800,0084,724A    ;2057   MISSA:  SC_K[.6]                          ; IF A TRAP OCCURRED SEE
U 124A, 0001,0024,0180,0800,0010,124B    ;2058           ALU_D.ANDNOT.MASK,CLK.UBCC        ; IF IT WAS A TB MISS TRAP.
U 124B, 0000,013C,4DF0,2C00,0000,1060    ;2059           Z?,Q_ID[TBER1]
U 1060, 0001,203E,0180,09F0,0000,0002    ;2060   =0      RETURN2,RC[0E]_Q                  ; NOT TB MISS.
U 1061, 0000,003E,0180,0800,0000,0003    ;2061           RETURN3                           ; TB MISS.
                                         ;2062   ; THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
                                         ;2063   ; RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
                                         ;2064   ; TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
                                         ;2065   ; HIT/MISS BIT IN TBER0 IS INCORRECT.
                                         ;2066   ; RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
                                         ;2067   ; CHECK HIT IN GROUP 0.
U 124C, 0000,003C,D580,0A70,0084,7062    ;2068   HIT0:   LAB_R[0E],SC_K[.6]
                                         ;2069   =0
U 1062, 0000,003D,0180,0800,0000,1218    ;2070   HIT:    ERLOOP
U 1063, 0000,003C,0180,52F8,0000,124D    ;2071           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK         ; NO TRAP IF HIT
U 124D, 0800,003C,49F0,2E78,0000,124E    ;2072           Q_ID[TBER0],D_R[0F]
U 124E, 0018,0038,1980,0AF8,0000,124F    ;2073           A[U_0(K),R[0F]_ALU
U 124F, 0001,203C,0180,09E8,0000,1250    ;2074           RC[0D]_Q
U 1250, 0003,001C,0180,09F0,0000,1251    ;2075           RC[0E]_ALU,ALU_NOT.MASK
U 1251, 0000,003C,0180,0A70,0000,1252    ;2076           LAB_R[0E]
U 1252, 001C,2000,0180,0800,0010,1253    ;2077           ALU_LA[A-B]D,CLK.UBCC                   ; SEE IF TRAP OCCURRED.
U 1253, 0001,013C,0180,09C8,0000,1064    ;2078           Z?,RC[9]_D
U 1064, 0000,003C,0180,0800,0000,1255    ;2079   =0      J/HITA                            ; TRAP OCCURRED.
U 1065, 0001,2024,0180,0800,0010,1254    ;2080           ALU_Q.ANDNOT.MASK,CLK.UBCC        ; NO TRAP BUT IS HIT/MISS BIT SET?
```

```
U 1254, 0000,013C,0180,0800,0000,1068   ;2081           Z?
U 1068, 0000,003E,0180,0800,0000,0004   ;2082   =0      RETURN4                         ; SET SO IT WAS A HIT.
U 1069, 0000,003E,0180,0800,0000,0003   ;2083           RETURN3                         ; CLEAR SO REFERENCE WAS A MISS.
U 1255, 0000,003C,D580,0800,0084,7256   ;2084   HITA:   SC_K[.6]                        ; TRAPPED, SO SEE IF TB MISS TRAP.
U 1256, 0001,0024,0180,0800,0010,1257   ;2085           ALU_D.ANDNOT.MASK,CLK.UBCC
U 1257, 0000,013C,0180,0800,0000,106A   ;2086           Z?
U 106A, 0000,003C,0180,0800,0000,1240   ;2087   =0      J/TBTRUE                        ; NOT TB MISS TRAP.
U 106B, 0000,003E,0180,0800,0000,0002   ;2088           RETURN2                         ; TB MISS TRAP OCCURRED.
                                        ;2089   ; CHECK HIT IN GROUP 1.
U 1258, 0000,003C,5D80,0A70,0084,7062   ;2090   HIT1:   LAB_R[0E],SC_K[.7],J/HIT
                                        ;2091   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 1259, 0118,0038,1B80,0800,0000,126D   ;2092   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 125A, 0118,0038,0B80,0800,0000,126D   ;2093   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 125B, 0118,0038,0780,0800,0000,126D   ;2094   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 125C, 0118,0038,C380,0800,0000,126D   ;2095   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 125D, 0018,0038,1980,0800,0000,1259   ;2096   DC0:    ALU_0(K),J/S00
U 125E, 0018,0038,1980,0800,0000,125A   ;2097   DC1:    ALU_0(K),J/S01
U 125F, 0018,0038,1980,0800,0000,125B   ;2098   DC2:    ALU_0(K),J/S10
U 1260, 0018,0038,1980,0800,0000,125C   ;2099   DC3:    ALU_0(K),J/S11
U 1261, 0018,0038,0980,0800,0000,1259   ;2100   DC4:    ALU_K[.2],J/S00
U 1262, 0018,0038,0980,0800,0000,125A   ;2101   DC5:    ALU_K[.2],J/S01
U 1263, 0018,0038,0980,0800,0000,125B   ;2102   DC6:    ALU_K[.2],J/S10
U 1264, 0018,0038,0980,0800,0000,125C   ;2103   DC7:    ALU_K[.2],J/S11
U 1265, 0018,0038,0580,0800,0000,1259   ;2104   DC8:    ALU_K[.1],J/S00
U 1266, 0018,0038,0580,0800,0000,125A   ;2105   DC9:    ALU_K[.1],J/S01
U 1267, 0018,0038,0580,0800,0000,125B   ;2106   DCA:    ALU_K[.1],J/S10
U 1268, 0018,0038,0580,0800,0000,125C   ;2107   DCB:    ALU_K[.1],J/S11
U 1269, 0018,0038,C180,0800,0000,1259   ;2108   DCC:    ALU_K[.FFFF],J/S00
U 126A, 0018,0038,C180,0800,0000,125A   ;2109   DCD:    ALU_K[.FFFF],J/S01
U 126B, 0018,0038,C180,0800,0000,125B   ;2110   DCE:    ALU_K[.FFFF],J/S10
U 126C, 0018,0038,C180,0800,0000,125C   ;2111   DCF:    ALU_K[.FFFF],J/S11
U 126D, 0100,003E,0380,0800,0000,0001   ;2112   SX:     D_D.LEFT2,SI/7,RETURN1
U 126E, 0018,0038,01C0,0800,0000,106C   ;2113   DC.5:   Q_K[.8]
                                        ;2114   =0
U 106C, 0000,003D,0180,0800,0000,1262   ;2115   DC.5A:  CALL,J/DC5
U 106D, 0019,2000,05C0,0800,0010,126F   ;2116           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 126F, 0000,013C,0180,0800,0000,1070   ;2117           Z?
U 1070, 0000,003C,0180,0800,0000,106C   ;2118   =0      J/DC.5A
U 1071, 0000,003E,0180,0800,0000,0001   ;2119           RETURN1
                                        ;2120   =0
U 1072, 0000,003D,0180,0800,0000,126E   ;2121   DC.A:   CALL,J/DC.5
U 1073, 0500,003E,0180,0800,0000,0001   ;2122           D_D.LEFT,SI/ZERO,RETURN1
U 1270, 0018,0038,01C0,0800,0000,1074   ;2123   DC.9:   Q_K[.8]
                                        ;2124   =0
U 1074, 0000,003D,0180,0800,0000,1266   ;2125   DC.9A:  CALL,J/DC9
U 1075, 0019,2000,05C0,0800,0010,1271   ;2126           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1271, 0000,013C,0180,0800,0000,1078   ;2127           Z?
U 1078, 0000,003C,0180,0800,0000,1074   ;2128   =0      J/DC.9A
U 1079, 0000,003E,0180,0800,0000,0001   ;2129           RETURN1
                                        ;2130   =0
U 107A, 0000,003D,0180,0800,0000,1270   ;2131   DC.C:   CALL,J/DC.9
U 107B, 0018,0038,C180,0800,0000,1272   ;2132           ALU_K[.FFFF]
U 1272, 0600,003E,0380,0800,0000,0001   ;2133           D_D.RIGHT,SI/7,RETURN1
                                        ;2134   =0
U 107C, 0000,003D,0180,0800,0000,1270   ;2135   DC.6:   CALL,J/DC.9
```

```
U 107D, 0018,0038,0580,0800,0000,1273     ;2136               ALU_K[.1]
U 1273, 0100,003E,0380,0800,0000,0001     ;2137               D_D.LEFT2,SI/7,RETURN1
                                          ;2138       =0
U 1098, 0000,003D,0180,0800,0000,1270     ;2139       DC.3:   CALL,J/DC.9
U 1099, 0018,0038,C180,0800,0000,1274     ;2140               ALU_K[.FFFF]
U 1274, 0500,003E,0380,0800,0000,0001     ;2141               D_D.LEFT,SI/7,RETURN1
                                          ;2142       ; THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
                                          ;2143       ; A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
                                          ;2144       ; SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
                                          ;2145       ; FOLLOWING DATA PATTERNS:
                                          ;2146       ;
                                          ;2147       ;       R[OB]           7FFFC000
                                          ;2148       ;       R[OC]           A4000000
                                          ;2149       ;       R[OD]           001FFFFF
                                          ;2150       ;
                                          ;2151       ;       RC[0]           A4155555
                                          ;2152       ;       RC[1]           4CCCC000
                                          ;2153       ;       RC[2]           0AAAAA80
                                          ;2154       ;
                                          ;2155       ;       RC[3]           A4199999
                                          ;2156       ;       RC[4]           55554000
                                          ;2157       ;       RC[5]           0CCCCC80
                                          ;2158       ;
                                          ;2159       ;       RC[6]           A40AAAAA
                                          ;2160       ;       RC[7]           33330000
                                          ;2161       ;       RC[8]           05555500
                                          ;2162       ;
                                          ;2163       ;       R[0]            A4066666
                                          ;2164       ;       R[1]            2AAA8000
                                          ;2165       ;       R[2]            03333300
                                          ;2166       ;
U 1275, 0F18,0038,0580,0800,0000,1276     ;2167       TBWPTP: D_0,ALU_K[.1]
U 1276, 0218,0038,0B80,0800,0000,1277     ;2168               D_D.RIGHT2,SI/7,ALU_K[.2]
U 1277, 0218,0038,0B80,0800,0000,1278     ;2169               D_D.RIGHT2,SI/7,ALU_K[.2]
U 1278, 0200,003C,0380,0800,0000,1279     ;2170               D_D.RIGHT2,SI/7
U 1279, 0001,003C,0180,0AE0,0000,127A     ;2171               R[OC]_D
U 127A, 0000,003C,6180,0800,0084,727B     ;2172               SC_K[.F]
U 127B, 0043,0010,0180,0AD8,0000,127C     ;2173               ALU_MASK+1,R[OB]_ALU.RIGHT,SI/ZERO
U 127C, 081B,0000,0580,0800,0000,127D     ;2174               D_0_K[.1]
U 127D, 0018,0038,21C0,0800,0000,127E     ;2175               Q_K[.14]
U 127E, 0019,2014,0580,0800,0082,127F     ;2176               ALU_Q+K[.1],SC_ALU
U 127F, 0003,001C,01C0,0800,0000,1280     ;2177               ALU_NOT.MASK,Q_ALU
U 1280, 001D,2014,0180,0AE8,0000,109A     ;2178               ALU_Q[A+B]D,R[OD]_ALU
U 109A, 0000,003D,0180,0800,0000,126E     ;2179       =0      CALL,J/DC.5
U 109B, 0000,003C,0180,0A68,0000,1281     ;2180               LAB_R[OD]
U 1281, 081C,2034,0180,0800,0000,1282     ;2181               ALU_LA[AND]D,D_ALU
U 1282, 081C,2030,0180,0A60,0000,1283     ;2182               LAB_R[OC],ALU_[A[OR]D,D_ALU
U 1283, 0001,003C,0180,0980,0000,10B8     ;2183               RC[0]_D
U 10B8, 0001,003D,0180,0AB0,0000,107A     ;2184       =0      R[6]_D,CALL,J/DC.C
U 10B9, 0000,003C,0180,0A58,0000,1284     ;2185               LAB_R[OB]
U 1284, 081C,2034,0180,0988,0000,10BA     ;2186               ALU_LA[AND]D,D_ALU,RC[1]_ALU
U 10BA, 0001,003D,0180,0AA8,0000,1048     ;2187       =0      R[5]_D,CALL,J/RELSUB
U 10BB, 0001,003C,0180,0990,0000,10D8     ;2188               RC[2]_D
U 10D8, 0000,003D,0180,0800,0000,1270     ;2189       =0      CALL,J/DC.9
U 10D9, 0000,003C,0180,0A68,0000,1285     ;2190               LAB_R[OD]
```

```
U 1285, 081C,2034,0180,0800,0000,1286   ;2191           ALU_LA[AND]D,D_ALU
U 1286, 081C,2030,0180,0A60,0000,1287   ;2192           LAB_R[0C],ALU_[A[OR]D,D_ALU
U 1287, 0001,003C,0180,0998,0000,10DA   ;2193           RC[3]_D
U 10DA, 0001,003D,0180,0AB0,0000,126E   ;2194   =0      R[6]_D,CALL,J/DC.5
U 10DB, 0000,003C,0180,0A58,0000,1288   ;2195           LAB_R[0B]
U 1288, 081C,2034,0180,09A0,0000,10F8   ;2196           ALU_LA[AND]D,D_ALU,RC[4]_ALU
U 10F8, 0001,003D,0180,0AA8,0000,1048   ;2197   =0      R[5]_D,CALL,J/RELSUB
U 10F9, 0001,003C,0180,09A8,0000,10FA   ;2198           RC[5]_D
U 10FA, 0000,003D,0180,0800,0000,1072   ;2199   =0      CALL,J/DC.A
U 10FB, 0000,003C,0180,0A68,0000,1289   ;2200           LAB_R[0D]
U 1289, 081C,2034,0180,0800,0000,128A   ;2201           ALU_LA[AND]D,D_ALU
U 128A, 081C,2030,0180,0A60,0000,128B   ;2202           LAB_R[0C],ALU_[A[OR]D,D_ALU
U 128B, 0001,003C,0180,09B0,0000,110A   ;2203           RC[6]_D
U 110A, 0001,003D,0180,0AB0,0000,1098   ;2204   =0      R[6]_D,CALL,J/DC.3
U 110B, 0000,003C,0180,0A58,0000,128C   ;2205           LAB_R[0B]
U 128C, 081C,2034,0180,09B8,0000,1150   ;2206           ALU_LA[AND]D,D_ALU,RC[7]_ALU
U 1150, 0001,003D,0180,0AA8,0000,1048   ;2207   =0      R[5]_D,CALL,J/RELSUB
U 1151, 0001,003C,0180,09C0,0000,1152   ;2208           RC[8]_D
U 1152, 0000,003D,0180,0800,0000,107C   ;2209   =0      CALL,J/DC.6
U 1153, 0000,003C,0180,0A68,0000,128D   ;2210           LAB_R[0D]
U 128D, 081C,2034,0180,0800,0000,128E   ;2211           ALU_LA[AND]D,D_ALU
U 128E, 081C,2030,0180,0A60,0000,128F   ;2212           LAB_R[0C],ALU_[A[OR]D,D_ALU
U 128F, 0001,003C,0180,0A80,0000,1156   ;2213           R[0]_D
U 1156, 0001,003D,0180,0AB0,0000,1072   ;2214   =0      R[6]_D,CALL,J/DC.A
U 1157, 0000,003C,0180,0A58,0000,1290   ;2215           LAB_R[0B]
U 1290, 081C,2034,0180,0A88,0000,1178   ;2216           ALU_LA[AND]D,D_ALU,R[1]_ALU
U 1178, 0001,003D,0180,0AA8,0000,1048   ;2217   =0      R[5]_D,CALL,J/RELSUB
U 1179, 0001,003E,0180,0A90,0000,0001   ;2218           R[2]_D,RETURN1
                                        ;2219   ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
                                        ;2220   ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
                                        ;2221   ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 1291, 0000,003F,0180,0800,0000,117C   ;2222   TARGC3: SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001   ;2223   117C:   RETURN1
U 117D, 0000,003E,0180,0800,0000,0002   ;2224   117D:   RETURN2
U 117E, 0000,003E,0180,0800,0000,0003   ;2225   117E:   RETURN3
U 117F, 0000,003E,0180,0800,0000,0004   ;2226   117F:   RETURN4
U 11FC, 0000,003D,0180,0800,0000,1219   ;2227   11FC:   ERROR1
U 11FD, 0000,003D,0180,0800,0000,1219   ;2228   11FD:   ERROR1
U 11FE, 0000,003D,0180,0800,0000,1219   ;2229   11FE:   ERROR1
U 11FF, 0000,003D,0180,0800,0000,1219   ;2230   11FF:   ERROR1
```

```
                                              .PAGE   "TEST A1        VAMX/VA, PAMX/VAMX, PA BUS AND TIME.OUT.ADDR REG TES
                                      ;*******************************************************************
                                      ;++
                                      ; TEST  A1      VAMX/VA, PAMX/VAMX, PA BUS AND TIME OUT ADDR REG TEST
                                      ;
                                      ; TEST DESCRIPTION
                                      ;       THIS IS A TEST OF THE PHYSICAL ADDRESS PATH FROM THE VA
                                      ;       ACROSS THE TB AND THE PA BUS INTO THE TIME
                                      ;       OUT ADDRESS REGISTER. THE TIME OUT ADDRESS REGISTER AND ITS
                                      ;       INTERFACE TO THE ID BUS IS ALSO TESTED. A 1 IS FLOATED ACROSS
                                      ;       A FIELD OF 0'S, AS IS A 0 ACROSS A FIELD OF 1'S
                                      ;       TO GENERATE THE TEST ADDRESSES.
                                      ;
                                      ; ERROR DESCRIPTION
                                      ;       EXPECTED ADDRESS (IN CORRECT BIT POSITION)
                                      ;       GOT ADDRESS (OR TWO BITS OF WHERE THE BEN WENT IN BEN TESTING)
                                      ;       ERROR CODE:
                                      ;               0=> ADRESS PATH FAILURE
                                      ;               1=> BRANCH FAILURE
                                      ;       EXPECTED VAMX<31:30>    (INVERSE OF EXPECTED ADDRESS)
                                      ;
                                      ;--
                                      ;*******************************************************************
                                      =0
U 117A, 0000,003D,0180,0800,0000,1076  TBPADR: NEWTST
U 117B, 0003,003C,0180,0AF8,0000,1292          R[OF]_0
U 1292, 0018,0038,8D80,0AA0,0000,1293          R[4]_K[.1F]              ; COUNTER R[4]=1F
U 1293, 081B,0000,0580,0800,0000,1294          ALU_0-K[.1],D_ALU        ; GENERATE A MASK
U 1294, 0200,003C,0180,0800,0000,1295          D_D.RIGHT2,SI7ZERO
U 1295, 0019,0024,0D80,0AC0,0000,1188          A[U_D[ANDNOT]K[.3],R[8]_ALU ; R[8]=3FFFFFFC
U 1188, 0000,003D,0180,0800,0000,1222  =0      CAL[,J/CSOFF             ; TURN SBI AND CACHE OFF.
U 1189, 0000,003C,0180,0800,0000,118A          NOP
U 118A, 0000,003D,0180,0800,0000,1218  =0      ERLOOP
U 118B, 0000,003C,8580,0800,0084,7296  TBPA0:  SC_K[.C]
U 1296, 0803,001C,0180,0800,0000,1297          ALU_NOT.MASK,D_ALU       ; UNLOCK TIME OUT
U 1297, 0000,003C,6580,3C00,0000,1298          ID[SBI.ERR]_D            ; ADDRESS REGISTER.
U 1298, 0000,003C,0180,0A20,0000,1299          LAB_R[4]                 ; GENERATE TEST PATTERN ADDRESS
U 1299, 0018,0014,0980,0800,0082,129A          ALU_LA+K[.2],SC_ALU
U 129A, 0803,001C,0180,0AA8,0200,129B          ALU_NOT.MASK,VA_ALU,R[5]_ALU,D_ALU
U 129B, 0000,0038,0180,09D8,0000,129C          ALU_MASK,RC[OB]_ALU
U 129C, 0000,003C,0180,0A40,0000,129D          LAB_R[8]                 ; GENERATE EXPECTED RESULT
U 129D, 001C,2034,0180,0A98,0000,129E          ALU_LA[AND]D,R[3]_ALU
U 129E, 0000,003C,0180,C800,0000,129F          FS/MCT,MCT/READ.P        ; TEST INSTRUCTION.
U 129F, 0000,003C,69F0,2C00,0000,12A0          Q_ID[TIME.ADDR]          ; GET TIME OUT ADDRESS REG.
U 12A0, 0000,003C,0188,0800,0000,12A1          Q_Q.LEFT2,SI/ZERO        ; CLEAR BITS<31:29> AND
U 12A1, 0000,003C,01A8,0800,0000,12A2          Q_Q.LEFT,SI/ZERO         ; ALIGN IT PROPERLY
U 12A2, 0000,003C,01B0,0800,0000,12A3          Q_Q.RIGHT,SI/ZERO
U 12A3, 0800,003C,0180,0A18,0000,12A4          D_R[3]
U 12A4, 0018,0038,1180,09F8,0000,12A5          RC[OF]_K[.4]
U 12A5, 0001,003C,0180,09F0,0000,12A6          RC[OE]_D
U 12A6, 0001,203C,0180,09E8,0000,12A7          RC[OD]_Q
U 12A7, 001D,2000,0180,0800,0010,12A8          ALU_Q-D,CLK.UBCC         ; SEE IF THE RESULT WAS CORRECT
U 12A8, 0000,013C,0180,0800,0000,118C          Z?
U 118C, 0003,003D,0180,09E0,0000,1219  =0      ERROR1,RC[OC]_0                   ; THE ADDRESS PATH FAILED.
                                      ; NOW TEST BEN/VA<31:30>:
```

```
U 118D, 0F00,003C,01C0,0A28,0000,12A9   ;2286          Q_R[5],D_0
U 12A9, 0000,003C,0180,09F0,0000,12AB   ;2287          RC[0E]_LA
U 12AB, 0100,003C,0008,0A28,0200,12AC   ;2288          D_D.LEFT2,Q_Q.LEFT2,SI/DIVD,VA_R[5]
U 12AC, 0018,0038,0DC0,0800,0000,12AD   ;2289          Q_K[.3]
U 12AD, 001D,2000,01C0,0800,0000,12AE   ;2290          ALU_Q-D,Q_ALU
U 12AE, 0000,1C3C,0180,0800,0000,1007   ;2291          PSL.MODE?                ; TEST INSTRUCTION.
U 1007, 0819,0000,0580,0800,0000,100F   ;2292   =00111 D_D-K[.1]                ; VAMUX<31:30>=11
U 100F, 0819,0000,0580,0800,0000,1017   ;2293          D_D-K[.1]                ; VAMUX<31:30>=10
U 1017, 0819,0000,0580,0800,0000,101F   ;2294          D_D-K[.1]                ; VAMUX<31:30>=01
U 101F, 0001,003C,0180,0800,0010,12AF   ;2295          ALU_D,CLK.UBCC           ; VAMUX<31:30>=00
U 12AF, 001D,0114,0180,09E8,0000,118E   ;2296          Z?,ALU_D+Q,RC[0D]_ALU
U 118E, 0018,0039,0580,09E0,0000,1219   ;2297   =0     ERROR1,RC[0C]_K[.T]      ; VA OR VAMUX <31:30> BITS
                                        ;2298                                   ; OR BEN 1C INCORRECT.
U 118F, 0000,003C,0180,0800,0000,12B0   ;2299          NOP
                                        ;2300   ; NOW TEST COMPLEMENT PATTERNS
U 12B0, 0000,003C,0180,0A20,0000,12B1   ;2301   TBPA1: LAB_R[4]                 ; GENERATE THE
U 12B1, 0018,0014,0980,0800,0082,12B2   ;2302          ALU_LA+K[.2],SC_ALU      ; TEST PATTERN
U 12B2, 0800,0038,0180,0AA8,0200,12B3   ;2303          ALU_MASK,VA_ALU,R[5]_ALU,D_ALU ; LOAD THE VA
U 12B3, 0003,001C,0180,09D8,0000,12B4   ;2304          ALU_NOT.MASK,RC[0B]_ALU
U 12B4, 0000,003C,0180,0A40,0000,12B5   ;2305          LAB_R[8]                 ; GENERATE THE EXPECTED RESULT
U 12B5, 001C,2034,0180,0A98,0000,12B6   ;2306          ALU_LA[AND]D,R[3]_ALU
U 12B6, 0000,003C,0180,C800,0000,12B7   ;2307          FS/MCT,MCT/READ.P        ; TEST INSTRUCTION
U 12B7, 0000,003C,69F0,2C00,0000,12B8   ;2308          Q_ID[TIME.ADDR]          ; GET THE RESULT
U 12B8, 0000,003C,0188,0800,0000,12B9   ;2309          Q_Q.LEFT2,SI/ZERO        ; CLEAR BITS <31:29> AND
U 12B9, 0000,003C,01A8,0800,0000,12BA   ;2310          Q_Q.LEFT,SI/ZERO         ; ALIGN IT PROPERLY
U 12BA, 0000,003C,01B0,0800,0000,12BB   ;2311          Q_Q.RIGHT,SI/ZERO
U 12BB, 0800,003C,0180,0A18,0000,12BC   ;2312          D_R[3]
U 12BC, 0800,0024,0D80,0800,0000,12BD   ;2313          ALU_D[ANDNOT]K[.3],D_ALU
U 12BD, 0018,0038,1180,09F8,0000,12BE   ;2314          RC[0F]_K[.4]
U 12BE, 0001,003C,0180,09F0,0000,12BF   ;2315          RC[0E]_D
U 12BF, 0001,203C,0180,09E8,0000,12C0   ;2316          RC[0D]_Q
U 12C0, 001D,2000,0180,0800,0010,12C1   ;2317          ALU_Q-D,CLK.UBCC         ; SEE IF THE RESULT IS CORRECT
U 12C1, 0000,013C,0180,0800,0000,1190   ;2318          Z?
U 1190, 0003,003D,0180,09E0,0000,1219   ;2319   =0     ERROR1,RC[0C]_0                ; ADDRESS PATH FAILED
                                        ;2320   ; NO TEST THE BRANCH ENABLE VA<31:30>
U 1191, 0F00,003C,01C0,0A28,0000,12C2   ;2321          Q_R[5],D_0
U 12C2, 0000,003C,0180,09F0,0000,12C3   ;2322          RC[0E]_LA
U 12C3, 0100,003C,0008,0A28,0200,12C4   ;2323          D_D.LEFT2,Q_Q.LEFT2,SI/DIVD,VA_R[5]
U 12C4, 0018,0038,0DC0,0800,0000,12C5   ;2324          Q_K[.3]
U 12C5, 001D,2000,01C0,0800,0000,12C6   ;2325          ALU_Q-D,Q_ALU
U 12C6, 0000,1C3C,0180,0800,0000,1027   ;2326          PSL.MODE?                ; TEST INSTRUCTION
U 1027, 0819,0000,0580,0800,0000,102F   ;2327   =00111 D_D-K[.1]                ; VAMUX<31:30>=11
U 102F, 0819,0000,0580,0800,0000,1037   ;2328          D_D-K[.1]                ; VAMUX<31:30>=10
U 1037, 0819,0000,0580,0800,0000,103F   ;2329          D_D-K[.1]                ; VAMUX<31:30>=01
U 103F, 0001,003C,0180,0800,0010,12C7   ;2330          ALU_D,CLK.UBCC           ; VAMUX<31:30>=00
U 12C7, 001D,2114,0180,09E8,0000,1192   ;2331          Z?,ALU_Q+D,RC[0D]_ALU
U 1192, 0018,0039,0580,09E0,0000,1219   ;2332   =0     ERROR1,RC[0C]_K[.T]      ; VA OR VAMUX <31:30> BITS
                                        ;2333                                   ; OR BEN 1C INCORRECT.
U 1193, 0000,003C,0180,0A20,0010,12C8   ;2334          ALU_R[4],CLK.UBCC        ; SEE IF ALL PATTERNS
U 12C8, 0000,013C,0180,0800,0000,1194   ;2335          Z?                       ; HAVE BEEN TESTED
U 1194, 0018,0000,0580,0AA0,0000,118B   ;2336   =0     R[4]_LA-K[.1],J/TBPA0
U 1195, 0000,003C,0180,0800,0000,1196   ;2337          NOP
```

```
                                          .PAGE   "TEST A2        VAMX IN COMPATIBILITY MODE TEST"
                                 ;****************************************************************
                                 ;++
                                 ; TEST  A2       VAMX COMPATIBILITY MODE TEST
                                 ;
                                 ; TEST DESCRIPTION
                                 ;        THIS IS A TEST OF THE VAMUX IN COMPATIBILITY MODE
                                 ;        WHEN THE PSL <31>=1 AND NOT IN CONSOLE COMMAND MODE
                                 ;        VAMUX <31:16>=0.
                                 ;
                                 ; ERROR DESCRIPTION
                                 ;        TEST ADDRESS PATTERN
                                 ;        GOT ADDRESS
                                 ;
                                 ;--
                                 ;****************************************************************
                                 =0
U 1196, 0000,003D,0180,0800,0000,1076   TBPCM:  NEWTST
U 1197, 0003,003C,0180,0AF8,0000,12C9           R[0F]_0
U 12C9, 0018,0038,8D80,0AA0,0000,12CA           R[4]_K[.1F]               ; COUNTER R[4]=1F
U 12CA, 0000,003C,6580,0800,0084,72CB           SC_K[.10]                 ; SET UP A MASK
U 12CB, 0803,0010,0180,0800,0000,12CC           ALU_MASK+1,D_ALU
U 12CC, 0801,0028,0180,0800,0000,12CD           ALU_NOT.D,D_ALU
U 12CD, 0019,0024,0D80,0AC0,0000,1198           ALU_D[ANDNOT]K[.3],R[8]_ALU ; R[8]=FFFC
U 1198, 0000,003D,0180,0800,0000,1222   =0      CALL[,J/CSOFF             ; TURN SBI AND CACHE OFF.
U 1199, 0000,003C,0180,0800,0000,119A           NOP
U 119A, 0000,003D,0180,0800,0000,1218   =0      ERLOOP
U 119B, 0000,003C,8580,0800,0084,72CE   TBCM0:  SC_K[.C]                  ; UNLOCK TIME OUT ADDRESS REGISTER
U 12CE, 0803,001C,0180,0800,0000,12CF           ALU_NOT.MASK,D_ALU
U 12CF, 0000,003C,6580,3C00,0000,12D0           ID[SBI.ERR]_D
U 12D0, 0000,003C,0180,0A20,0000,12D1           LAB_R[4]                  ; GENERATE TEST PATTERN ADDRESS
U 12D1, 0018,0014,0980,0800,0082,12D2           ALU_LA+K[.2],SC_ALU
U 12D2, 0803,001C,0180,0AA8,0200,12D3           ALU_NOT.MASK,VA_ALU,R[5]_ALU,D_ALU ; LOAD THE VA
U 12D3, 0000,003C,0180,0A40,0000,12D4           LAB_R[8]                  ; GENERATE THE
U 12D4, 001C,2034,0180,0A98,0000,12D5           ALU_LA[AND]D,R[3]_ALU     ; EXPECTED RESULT
U 12D5, 0000,003C,8D80,0800,0084,72D6           SC_K[.1F]
U 12D6, 0803,001C,0180,0800,0000,12D7           ALU_NOT.MASK,D_ALU
U 12D7, 0000,003C,0180,1C00,0000,12D8           CID7CONT                  ; GET OUT OF CONSOLE MODE
U 12D8, 0000,003C,3D80,3C00,0000,12D9           ID[PSL]_D                 ; SET PSL <31> , CM
U 12D9, 0000,003C,0180,0800,0000,12DA           NOP
U 12DA, 0000,003C,0180,C800,0000,12DB           FS/MCT,MCT/READ.P         ; TEST INSTRUCTION.
U 12DB, 0F00,003C,69F0,2C00,0000,12DC           Q_ID[TIME.ADDR],D_0       ; GET TIME OUT ADDRESS REG.
U 12DC, 0000,003C,3D80,3C00,0000,12DD           ID[PSL]_D                 ; CLEAR THE COMPATIBILITY MODE BIT
U 12DD, 0000,003C,0188,0800,0000,12DE           Q_Q.LEFT2,SI/ZERO         ; CLEAR BITS <31:29> OF THE
U 12DE, 0000,003C,01A8,0800,0000,12DF           Q_Q.LEFT,SI/ZERO          ; RESULT AND ALIGN
U 12DF, 0000,003C,01B0,0800,0000,12E0           Q_Q.RIGHT,SI/ZERO         ; IT PROPERLY
U 12E0, 0800,003C,0180,0A18,0000,12E1           D_R[3]
U 12E1, 0018,0038,0980,09F8,0000,12E2           RC[0F]_K[.2]
U 12E2, 0001,003C,0180,09F0,0000,12E3           RC[0E]_D
U 12E3, 0001,203C,0180,09E8,0000,12E4           RC[0D]_Q
U 12E4, 001D,2000,0180,0800,0010,12E5           ALU_Q-D,CLK.UBCC          ; IS THE RESULT CORRECT?
U 12E5, 0000,013C,0180,0800,0000,119C           Z?
U 119C, 0000,003D,0180,0800,0000,1219   =0      ERROR1                    ; REPORT ERROR
                                        ; NOW TEST BEN VA<31:30> IN COMPATIBILITY MODE
U 119D, 0F00,003C,01C0,0A28,0000,12E6           Q_R[5],D_0
```

```
U 12E6, 0000,003C,0180,09F0,0000,12E7    ;2393          RC[0E]_LA
U 12E7, 0000,003C,8D80,0800,0084,72E8    ;2394          SC_K[.1F]
U 12E8, 0803,001C,0180,0800,0000,12E9    ;2395          ALU_NOT.MASK,D_ALU
U 12E9, 0000,003C,3D80,3C00,0000,12EA    ;2396          ID[PSL]_D                ; SET COMPATIBILITY MODE BIT
U 12EA, 0F00,003C,0180,0800,0000,12EB    ;2397          D_0
U 12EB, 0100,003C,0008,0A28,0200,12EC    ;2398          D_D.LEFT2,Q_Q.LEFT2,SI/DIVD,VA_R[5]
U 12EC, 0000,1C3C,0180,0800,0000,1047    ;2399          PSL.MODE?                ; TEST INSTRUCTION
U 1047, 0000,003D,0180,0800,0000,1219    ;2400   =00111 ERROR1                   ; VAMUX<31:30>=11
U 104F, 0000,003D,0180,0800,0000,1219    ;2401          ERROR1                   ; VAMUX<31:30>=10
U 1057, 0000,003D,0180,0800,0000,1219    ;2402          ERROR1                   ; VAMUX<31:30>=01
U 105F, 0F00,003C,0180,0800,0000,12ED    ;2403          D_0                      ; RESULT CORRECT
U 12ED, 0000,003C,3D80,3C00,0000,12EE    ;2404          ID[PSL]_D                ; CLEAR COMPATIBILITY MODE
                                         ;2405   ; NOW TEST COMP[EMENT PATTERN
U 12EE, 0000,003C,0180,0A20,0000,12EF    ;2406   TBCM1: LAB_R[4]                 ; GENERATE TEST ADDRESS PATTERN
U 12EF, 0018,0014,0980,0800,0082,12F0    ;2407          ALU_LA+K[.2],SC_ALU
U 12F0, 0800,0038,0180,0AA8,0200,12F1    ;2408          ALU_MASK,VA_ALU,R[5]_ALU,D_ALU ; LOAD THE VA
U 12F1, 0000,003C,0180,0A40,0000,12F2    ;2409          LAB_R[8]                 ; GENERATE THE EXPECTED RESULT
U 12F2, 001C,2034,0180,0A98,0000,12F3    ;2410          ALU_LA[AND]D,R[3]_ALU
U 12F3, 0000,003C,8D80,0800,0084,72F4    ;2411          SC_K[.1F]
U 12F4, 0803,001C,0180,0800,0000,12F5    ;2412          ALU_NOT.MASK,D_ALU
U 12F5, 0000,003C,0180,1C00,0000,12F6    ;2413          CID7CONT                 ; MAKE SURE NOT IN CONSOLE MODE
U 12F6, 0000,003C,3D80,3C00,0000,12F7    ;2414          ID[PSL]_D                ; SET COMPATIBILITY MODE BIT
U 12F7, 0000,003C,0180,0800,0000,12F8    ;2415          NOP
U 12F8, 0000,003C,0180,C800,0000,12F9    ;2416          FS/MCT,MCT/READ.P        ; TEST INSTRUCTION
U 12F9, 0F00,003C,69F0,2C00,0000,12FA    ;2417          Q_ID[TIME.ADDR],D_0      ; GET THE RESULT
U 12FA, 0000,003C,3D80,3C00,0000,12FB    ;2418          ID[PSL]_D                ; CLEAR COMPATIBILITY MODE BIT
U 12FB, 0000,003C,0188,0800,0000,12FC    ;2419          Q_Q.LEFT2,SI/ZERO        ; CLEAR BITS <31:29> OF THE RESULT
U 12FC, 0000,003C,01A8,0800,0000,12FD    ;2420          Q_Q.LEFT,SI/ZERO         ; AND ALIGN IT PROPERLY
U 12FD, 0000,003C,01B0,0800,0000,12FE    ;2421          Q_Q.RIGHT,SI/ZERO
U 12FE, 0800,003C,0180,0A18,0000,12FF    ;2422          D_R[3]
U 12FF, 0819,0024,0D80,0800,0000,1300    ;2423          A[U_D[ANDNOT]K[.3],D_ALU
U 1300, 0018,0038,0980,09F8,0000,1301    ;2424          RC[0F]_K[.2]
U 1301, 0001,003C,0180,09F0,0000,1302    ;2425          RC[0E]_D
U 1302, 0001,203C,0180,09E8,0000,1303    ;2426          RC[0D]_Q
U 1303, 001D,2000,0180,0800,0010,1304    ;2427          ALU_Q-D,CLK.UBCC         ; RESULT CORRECT?
U 1304, 0000,013C,0180,0800,0000,119E    ;2428          Z?
U 119E, 0000,003D,0180,0800,0000,1219    ;2429   =0     ERROR1                   ; REPORT ERROR
                                         ;2430   ; NOW TEST BEN VA<31:30>
U 119F, 0F00,003C,01C0,0A28,0000,1305    ;2431          Q_R[5],D_0
U 1305, 0000,003C,0180,09F0,0000,1306    ;2432          RC[0E]_LA
U 1306, 0100,003C,0008,0A28,0200,1307    ;2433          D_D.LEFT2,Q_Q.LEFT2,SI/DIVD,VA_R[5]
U 1307, 0000,003C,8D80,0800,0084,7308    ;2434          SC_K[.1F]
U 1308, 0803,001C,0180,0800,0000,1309    ;2435          ALU_NOT.MASK,D_ALU
U 1309, 0000,003C,3D80,3C00,0000,130A    ;2436          ID[PSL]_D                : SET COMPATIBILITY MODE BIT
U 130A, 0000,003C,0180,0800,0000,130B    ;2437          NOP
U 130B, 0000,1C3C,0180,0800,0000,1067    ;2438          PSL.MODE?                ; TEST INSTRUCTION
U 1067, 0000,003D,0180,0800,0000,1219    ;2439   =00111 ERROR1                   ; VAMUX<31:30>=11
U 106F, 0000,003D,0180,0800,0000,1219    ;2440          ERROR1                   ; VAMUX<31:30>=10
U 1077, 0000,003D,0180,0800,0000,1219    ;2441          ERROR1                   ; VAMUX<31:30>=01
U 107F, 0F00,003C,0180,0800,0000,130C    ;2442          D_0                      ; VAMUX<31:30>=00
U 130C, 0000,003C,3D80,3C00,0000,130D    ;2443          ID[PSL]_D                ; CLEAR COMPATIBILITY MODE
U 130D, 0000,003C,0180,0A20,0010,130E    ;2444          ALU_R[4],CLK.UBCC        ; FINISHED TEST?
U 130E, 0000,013C,0180,0800,0000,11A0    ;2445          Z?
U 11A0, 0018,0000,0580,0AA0,0000,119B    ;2446   =0     R[4]_LA-K[.1],J/TBCM0
U 11A1, 0000,003C,0180,0800,0000,11A2    ;2447          NOP
```

```
                                                  .PAGE   "TEST A3       MSC/INHIBIT COMPATIBILITY MODE TEST USING THE VAMX"
                                           ;*********************************************************************
                                           ;++
                                           ; TEST  A3      MSC/INHIBIT COMPATIBILITY MODE TEST USING THE VAMX
                                           ;
                                           ; TEST DESCRIPTION
                                           ;      THIS IS A TEST OF MSC/INHIBIT COMPATIBILITY MODE AND ITS
                                           ;      AFFECT UPON THE VAMUX.
                                           ;
                                           ; ERROR DESCRIPTION
                                           ;      EXPECTED ADDRESS
                                           ;      GOT ADDRESS
                                           ;
                                           ;--
                                           ;*********************************************************************
                                           =0
U 11A2, 0000,003D,0180,0800,0000,1076      INCM:  NEWTST
U 11A3, 0000,003C,8580,0800,0084,730F             SC_K[.C]                  ; UNLOCK TIME OUT ADDRESS REGISTER.
U 130F, 0803,001C,0180,0800,0000,1310             ALU_NOT.MASK,D_ALU
U 1310, 0000,003C,6580,3C00,0000,1311             ID[SBI.ERR]_D
U 1311, 0000,003C,8D80,0800,0084,7312             SC_K[.1F]
U 1312, 0803,001C,0180,0800,0000,1313             ALU_NOT.MASK,D_ALU
U 1313, 0000,003C,0180,1C00,0000,1314             CID7CONT                  ; GET OUT OF CONSOLE MOE
U 1314, 0000,003C,3D80,3C00,0000,1315             ID[PSL]_D                 ; SET COMPATIBILITY MODE
U 1315, 0F00,003C,0180,0800,0000,11A4             D_0
U 11A4, 0000,003D,4980,3C00,0000,1222      =0     ID[TBER0]_D,CALL,J/CSOFF ; TURN OFF MME AND CACHE
U 11A5, 081B,001C,0D80,0800,0200,1316             ALU_NOT.K[.3],D_ALU,VA_ALU ; LOAD THE VA
U 1316, 0100,003C,0180,0800,0000,1317             D_D.LEFT2,SI/ZERO         ; COMPUTE THE EXPECTED RESULT
U 1317, 0200,003C,0180,0800,0000,1318             D_D.RIGHT2,SI/ZERO
U 1318, 0001,003C,0180,09F0,0000,1319             RC[0E]_D
U 1319, 0018,0038,0980,09F8,3C00,131A             RC[0F]_K[.2],MSC/INH.CM.ADDR
U 131A, 0000,003C,0180,5000,3C00,131B             FS/MCT,MCT/READ.V.WCHK,MSC/INH.CM.ADDR ; TEST INSTRUCTION
U 131B, 0F00,003C,69F0,2C00,0000,131C             Q_ID[TIME.ADDR],D_0       ; GET THE RESULT
U 131C, 0000,003C,3D80,3C00,0000,131D             ID[PSL]_D                 ; CLEAR COMPATIBILITY MODE
U 131D, 0000,003C,0188,0800,0000,131E             Q_Q.LEFT2,SI/ZERO         ; CLEAR BITS<31:29> OF THE RESULT
U 131E, 0000,003C,01A8,0800,0000,131F             Q_Q.LEFT,SI/ZERO          ; AND ALIGN IT PROPERLY
U 131F, 0000,003C,01B0,0800,0000,1320             Q_Q.RIGHT,SI/ZERO
U 1320, 0810,0038,0180,0970,0000,1321             D_RC[0E]
U 1321, 0001,203C,0180,09E8,0000,1322             RC[0D]_Q
U 1322, 001D,2000,0180,0800,0010,1323             ALU_Q-D,CLK.UBCC          ; RESULT CORRECT?
U 1323, 0000,013C,0180,0800,0000,11A6             Z?
U 11A6, 0000,003D,0180,0800,0000,1219      =0     ERROR1
U 11A7, 0000,003C,0180,0800,0000,11A8             NOP
```

```
        .PAGE   "TEST A4        TB WRITE PULSE LOGIC TEST"
;******************************************************************
;++
; TEST  A4      TB WRITE PULSE TEST
;
; TEST DESCRIPTION
;       THIS IS A TEST OF THE TB WRITE PULSE LOGIC, SIMPLE
;       HITS AND MISSES. ALSO TESTED IMPLICITELY IS THE ABILITY
;       THE PARITY CHECKERS AND GENERATORS TO OPERATE CORRECTLY
;       UPON SIMPLE DATA PATTERNS. LOCATION 0 IS USED IN
;       BOTH GROUPS OF THE TB. LOCATION 0 MEANS VA<31>=VA<13:09>=0.
;       NOTE THAT THE FORCE REPLACE BITS
;       IN TBERO ARE USED EXTENSIVELY.
;       THE TEST SEQUENCE IS:
;               1       WRITE (VA=2AAA8000 PTE=A4066666) INTO BOTH GROUPS
;               2       WRITE (VA=4CCCC000 PTE=A4155555) INTO GROUP 0 AND
;                               CHECK WRITE PULSE
;               3       WRITE (VA=55554000 PTE=A4199999) INTO GROUP 1 AND
;                               CHECK WRITE PULSE
;               4       READ (VA=4CCCC000 PTE=A4155555) AND CHECK FOR HIT IN GROUP 0
;               5       READ (VA=55554000 PTE=A4199999) AND CHECK FOR HIT IN GROUP 1
;               6       WRITE (VA=33330000 PTE=A40AAAAA) INTO GROUP 0
;               7       READ (VA=4CCCC000) AND
;                               CHECK FOR MISS TO BOTH GROUPS
;               8       READ (VA=33330000 PTE=A40AAAAA) AND CHECK FOR HIT IN GROUP 0
;               9       READ (VA=55554000 PTE=A4199999) AND CHECK FOR HIT IN GROUP 1
;               A       WRITE (VA=2AAA8000 PTE=A4066666) INTO GROUP 1
;               B       READ (VA=55554000) AND
;                               CHECK FOR MISS IN BOTH GROUPS
;               C       READ (VA=33330000 PTE=A40AAAAA) AND CHECK FOR HIT IN GROUP 0
;               D       READ (VA=2AAA8000 PTE=A4066666) AND CHECK FOR HIT IN GROUP 1
;               E       WRITE (VA=4CCCC000 PTE=A4155555) INTO BOTH GROUPS
;               F       READ (VA=33330000) AND
;                               CHECK FOR MISS IN BOTH GROUPS
;               10      READ (VA=2AAA8000) AND
;                               CHECK FOR MISS IN BOTH GROUPS
;               11      READ (VA=4CCCC000 PTE=A4155555) AND CHECK FOR HIT IN GROUP 0
;               12      WRITE (VA=33330000 PTE=A40AAAAA) INTO GROUP 0
;               13      READ (VA=4CCCC000 PTE=A4155555) AND CHECK FOR HIT IN GROUP 1
;               14      READ (VA=33330000 PTE=A40AAAAA) AND CHECK FOR HIT IN GROUP 0
;               15      WRITE (VA=55554000 PTE=A4199999) INTO A RANDOM GROUP
;               16      WRITE (VA=2AAA8000 PTE=A4066666) INTO A RANDOM GROUP
;                               (DIFFERENT GROUP THAN THE ONE USED IN 21)
;               17      READ (VA=55554000 PTE=A4199999) AND
;                               CHECK FOR HIT IN GROUP AS
;                               DETERMINED BY WRITE PULSE
;                               GENERATED IN 21 AND 22
;               18      READ (VA=2AAA8000 PTE=A4066666) AND
;                               CHECK FOR HIT IN GROUP AS
;                               DETERMINED IN 23 (HERE USE THE
;                               OTHER GROUP)
;               19      WRITE (VA=4CCCC000 PTE=A4155555) INTO GROUP 1
;               1A      WRITE (VA=33330000 PTE=A40AAAAA) INTO GROUP 0
;               1B      WRITE HIT (VA=4CCCC000 PTE=A4199999)  SHOULD
;                               GO INTO GROUP 1
```

```
                                          ;                 1C      READ (VA=33330000 PTE=A40AAAAA) AND CHECK FOR HIT IN GROUP 0
                                          ;                 1D      READ (VA=4CCCC000 PTE=A4199999) AND CHECK FOR HIT IN GROUP 1
                                          ;                 1E      WRITE HIT (VA=33330000 PTE=A4066666)  SHOULD
                                          ;                                 GO INTO GROUP 0
                                          ;                 1F      READ (VA=4CCCC000 PTE=A4199999) AND CHECK FOR HIT IN GROUP 1
                                          ;                 20      READ (VA=33330000 PTE=A4066666) AND CHECK FOR HIT IN GROUP 0
                                          ;                 21      SET FORCE MISS GROUP 0 BIT
                                          ;                 22      READ (VA=33330000) AND
                                          ;                                 CHECK FOR MISS IN BOTH GROUPS
                                          ;                 23      CLEAR FORCE MISS GROUP 0 BIT
                                          ;                 24      READ (VA=33330000 PTE=A4066666) AND CHECK FOR HIT IN GROUP 0
                                          ;                 25      SET FORCE MISS GROUP 1 BIT
                                          ;                 26      READ (VA=4CCCC000) AND
                                          ;                                 CHECK FOR MISS IN BOTH GROUPS
                                          ;                 27      CLEAR FORCE MISS GROUP 1 BIT
                                          ;                 28      READ (VA=4CCCC000 PTE=A4199999) AND CHECK FOR HIT IN GROUP 1
                                          ;       DONE
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;
                                          ;   SUBTEST 1:
                                          ;       EXPECTED TBER1
                                          ;       GOT TBER1
                                          ;       N/A
                                          ;       N/A
                                          ;       VA WRITTEN
                                          ;       N/A
                                          ;
                                          ;   SUBTEST     2:
                                          ;       EXPECTED TBER0 (IF CHECKING HIT/MISS BITS)
                                          ;               OR GOT TBER1 (IF UNEXPECTED UTRAP OCCURRED)
                                          ;       ACTUAL TBER0
                                          ;       EXPECTED TIME OUT ADDRESS REGISTER
                                          ;       ACTUAL TIME OUT ADDRESS REGISTER
                                          ;       VA WRITTEN
                                          ;       UTRAP FLAG (IF UNEXPECTED UTRAP OCCURS)
                                          ;               FLAG            UTRAP TYPE
                                          ;               ----            ----------
                                          ;               DE              NO UTRAP OCCURRED
                                          ;               5E              TB PARITY ERROR
                                          ;               9E              TB MISS
                                          ;               CE              TB PROTECTION ERROR
                                          ;               D6              TB MODIFY BIT ERROR
                                          ;               DA              X PAGE UTRAP
                                          ;               DC              UNALIGNED DATA UTRAP
                                          ;
                                          ;--
                                          ;*****************************************************************
                                          =0
U 11A8, 0000,003D,0180,0800,0000,1076     TBWPA:  NEWTST
U 11A9, 0000,003C,0180,0800,0000,11AA             NOP
U 11AA, 0000,003D,0180,0800,0000,1222     =0      CALL,J/CSOFF            ; TURN OFF THE CACHE AND SBI
U 11AB, 0000,003C,0180,0800,0000,11AC             NOP
U 11AC, 0000,003D,0180,0800,0000,1275     =0      CALL,J/TBWPTP           ; GENERATE SOME TEST PATTERNS
U 11AD, 0F00,003C,0180,0800,0000,11AE             D_0
```

```
U 11AE, 0000,003D,0180,0800,0000,1014   ;2601   =0      CALL,J/DC.DE
U 11AF, 0001,003C,0180,0AF0,0000,11B0   ;2602           R[0E]_D                 ; R[0E]=DE, THE UTRAP FLAG
U 11B0, 0000,003D,0180,0800,0000,1218   ;2603   =0      ERLOOP
U 11B1, 0018,0038,D580,09F8,0000,1324   ;2604           RC[0F]_K[.6]            ; RESET SUBTEST NUMBER
U 1324, 0000,003C,8580,0800,0084,7325   ;2605           SC_K[.C]                ; UNLOCK THE TIME OUT ADDRESS REGISTER
U 1325, 0803,001C,0180,0800,0000,1326   ;2606           ALU_NOT.MASK,D_ALU
U 1326, 0000,003C,6580,3C00,0000,11B2   ;2607           ID[SBI.ERR]_D
U 11B2, 0000,003D,0180,0800,0000,121D   ;2608   =0      SUBTEST
                                        ;2609   ;/////////////////////////////////////////////////////////
                                        ;2610   ; [1]   WRITE INTO BOTH GROUPS:
                                        ;2611   ;               VA=2AAA8000
                                        ;2612   ;               PTE=A4066666
                                        ;2613   ;
U 11B3, 0000,003C,0180,0A08,0200,1327   ;2614           VA_R[1]                 ; R[1]=2AAA8000
U 1327, 0000,003C,0180,0A00,0000,11B4   ;2615           LAB_R[0]                ; R[0]=A4066666
U 11B4, 0000,003D,0180,0AC0,0000,1044   ;2616   =0      R[8]_LA,CALL,J/TBWRB    ; TBWRB WRITES INTO BOTH TB GROUPS
                                        ;2617   ;//////////7//////////////////////////////////////////////
                                        ;2618   ; [2]   WRITE INTO GROUP 0:
                                        ;2619   ;               VA=4CCCC000
                                        ;2620   ;               PTE=A4155555
                                        ;2621   ;       AND CHECK THE GROUP 0 WRITE PULSE IN TBER1
                                        ;2622   ;
U 11B5, 0010,0038,0180,0908,0200,1328   ;2623           VA_RC[1]                ; RC[1]=4CCCC000
U 1328, 0010,0038,0180,09D0,0000,1329   ;2624           RC[0A]_LC
U 1329, 0000,003C,0180,0900,0000,11B6   ;2625           LC_RC[0]                ; RC[0]=A4155555
U 11B6, 0010,0039,0180,0AC0,0000,103C   ;2626   =0      R[8]_LC,CALL,J/TBWR0    ; TBWR0 WRITES INTO TB GROUP 0
U 11B7, 0000,003C,D580,0800,0084,732A   ;2627           SC_K[.6]                ; CHECK TBER1<6> THE WRITE PULSE BIT
U 132A, 0003,003C,0180,09F0,0000,132B   ;2628           RC[0E]_Q
U 132B, 0001,2024,0180,0800,0010,132C   ;2629           ALU_Q.ANDNOT.MASK,CLK.UBCC
U 132C, 0000,013C,0180,0800,0000,11B8   ;2630           Z?
U 11B8, 0001,203D,0180,09E8,0000,1219   ;2631   =0      RC[0D]_Q,ERROR1         ; THE TB WRITE PULSE BIT WAS INCORRECT.
                                        ;2632   ;////////////////////////////////7////////////////////////
                                        ;2633   ; [3]   WRITE INTO GROUP 1:
                                        ;2634   ;               VA=55554000
                                        ;2635   ;               PTE=A4199999
                                        ;2636   ;       AND CHECK THE WRITE PULSE BIT IN TBER1
                                        ;2637   ;
U 11B9, 0010,0038,0180,0920,0200,132D   ;2638           VA_RC[4]                ; RC[4]=55554000
U 132D, 0010,0038,0180,09D0,0000,132E   ;2639           RC[0A]_LC
U 132E, 0000,003C,0180,0918,0000,11BA   ;2640           LC_RC[3]                ; RC[3]=A4199999
U 11BA, 0010,0039,0180,0AC0,0000,1024   ;2641   =0      R[8]_LC,CALL,J/TBWR1    ; TBWR1 WRITES INTO GROUP 1
U 11BB, 0000,003C,D580,0800,0084,732F   ;2642           SC_K[.6]                ; CHECK THE WRITE PULSE BIT
U 132F, 0003,001C,0180,09F0,0000,1330   ;2643           ALU_NOT.MASK,RC[0E]_ALU
U 1330, 0001,2024,0180,0800,0010,1331   ;2644           ALU_Q.ANDNOT.MASK,CLK.UBCC
U 1331, 0000,013C,0180,0800,0000,11BC   ;2645           Z?
U 11BC, 0000,003C,0180,0800,0000,11BF   ;2646   =0      J/TBWPB
U 11BD, 0001,203D,0180,09E8,0000,1219   ;2647           RC[0D]_Q,ERROR1         ; TBER1<6> THE WRITE PULSE BIT WAS INCORRECT
U 11BE, 0000,003D,0180,0800,0000,121D   ;2648   =0      SUBTEST
                                        ;2649   ;/////////////////////////////////////////////////////////
                                        ;2650   ; [4]   READ
                                        ;2651   ;               VA=4CCCC000
                                        ;2652   ;       CHECK FOR HIT IN GROUP 0
                                        ;2653   ;       WITH RELOCATED ADDRESS (IN TIME OUT ADDRESS REGISTER)
                                        ;2654   ;               0AAAAA80
                                        ;2655   ;
```

```
U 11BF, 0010,0038,0180,0908,0200,1332  ;2656  TBWPB:  VA_RC[1]                     ; RC[1]=4CCCC000
U 1332, 0010,0038,0180,09D0,0000,1333  ;2657          RC[0A]_LC
U 1333, 0000,003C,0180,0910,0000,1080  ;2658          LC_RC[2]                     ; RC[2]=0AAAAA80
U 1080, 0010,0039,0180,0AB8,0000,124C  ;2659  =000    R[7]_LC,CALL,J/HIT0          ; HIT0 CHECKS FOR A HIT IN GROUP 0
U 1081, 0000,003D,0180,0800,0000,1219  ;2660          ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1082, 0000,003D,0180,0800,0000,1219  ;2661          ERROR1          ; A TB MISS TRAP OCCURRED.
U 1083, 0000,003D,0180,0800,0000,1219  ;2662          ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET CORRECTLY.
U 1084, 0000,003D,0180,0800,0000,1232  ;2663          CALL,J/RELCHK                ; CHECK RELOCATION.
U 1085, 0000,003D,0180,0800,0000,1219  ;2664          ERROR1          ; A UTRAP OCCURRED.
U 1086, 0000,003D,0180,0800,0000,1219  ;2665          ERROR1          ; NO TRAP BUT RELOCATION INCORRECT.
U 1087, 0000,003C,0180,0000,0000,1334  ;2666          FS/MCT,MCT/TEST.RCHK         ; TEST BEN/TB.TEST
U 1334, 0000,1D3C,0180,0800,0000,109C  ;2667          BEN/TB.TEST                  ; TEST INSTRUCTION FOR BEN/TB.TEST
U 109C, 0000,003C,0180,0800,0000,1335  ;2668  =11100  J/TPB1
U 109D, 0000,003D,0180,0800,0000,1219  ;2669          ERROR1                       ; BRANCH WENT TO WRONG ADDRESS
U 109E, 0000,003D,0180,0800,0000,1219  ;2670          ERROR1
U 109F, 0000,003D,0180,0800,0000,1219  ;2671          ERROR1
U 1335, 0000,003C,0180,0800,0000,1336  ;2672  TPB1:   NOP
                                       ;2673  ;/////////////////////////////////////////////////////////////////
                                       ;2674  ; [5]   READ
                                       ;2675  ;                VA=55554000
                                       ;2676  ;       CHECK FOR HIT IN GROUP 1
                                       ;2677  ;       AND CHECK RELOCATED ADDRESS (AS IT APPEARS IN THE TIME OUT
                                       ;2678  ;       ADDRESS REGISTER:
                                       ;2679  ;                0CCCCC80
                                       ;2680  ;
U 1336, 0010,0038,0180,0920,0200,1337  ;2681          VA_RC[4]                     ; RC[4]=55554000
U 1337, 0010,0038,0180,09D0,0000,1338  ;2682          RC[0A]_LC
U 1338, 0000,003C,0180,0928,0000,1088  ;2683          LC_RC[5]                     ; RC[5]=0CCCCC80
U 1088, 0010,0039,0180,0AB8,0000,1258  ;2684  =000    R[7]_LC,CALL,J/HIT1          ; HIT1 CHECKS FOR A HIT IN GROUP 1.
U 1089, 0000,003D,0180,0800,0000,1219  ;2685          ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 108A, 0000,003D,0180,0800,0000,1219  ;2686          ERROR1          ; A TB MISS TRAP OCCURRED.
U 108B, 0000,003D,0180,0800,0000,1219  ;2687          ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET CORRECTLY.
U 108C, 0000,003D,0180,0800,0000,1232  ;2688          CALL,J/RELCHK                ; CHECK THE RELOCATED ADDRESS.
U 108D, 0000,003D,0180,0800,0000,1219  ;2689          ERROR1          ; A TRAP OCCURRED.
U 108E, 0000,003D,0180,0800,0000,1219  ;2690          ERROR1          ; NO UTRAP BUT RELOCATION INCORRECT.
U 108F, 0000,003C,0180,0000,0000,1339  ;2691          FS/MCT,MCT/TEST.RCHK         ; TEST THE BEN/TB.TEST
U 1339, 0000,1D3C,0180,0800,0000,10BC  ;2692          BEN/TB.TEST                  ; TEST INSTRUCTION FOR BRANCH TB.TEST
U 10BC, 0000,003C,0180,0800,0000,133A  ;2693  =11100  J/TPB2
U 10BD, 0000,003D,0180,0800,0000,1219  ;2694          ERROR1                       ; BRANCH WENT TO WRONG ADDRESS
U 10BE, 0000,003D,0180,0800,0000,1219  ;2695          ERROR1
U 10BF, 0000,003D,0180,0800,0000,1219  ;2696          ERROR1
U 133A, 0000,003C,0180,0800,0000,133B  ;2697  TPB2:   NOP
                                       ;2698  ;/////////////////////////////////////////////////////////////////
                                       ;2699  ; [6]   WRITE INTO GROUP 0
                                       ;2700  ;                VA=33330000
                                       ;2701  ;                PTE=A40AAAAA
                                       ;2702  ;
U 133B, 0010,0038,0180,0938,0200,133C  ;2703          VA_RC[7]                     ; RC[7]=33330000
U 133C, 0010,0038,0180,09D0,0000,133D  ;2704          RC[0A]_LC
U 133D, 0000,003C,0180,0930,0000,11C0  ;2705          LC_RC[6]                     ; RC[6]=A40AAAAA
U 11C0, 0010,0039,0180,0AC0,0000,103C  ;2706  =0      R[8]_LC,CALL,J/TBWR0         ; TBWR0 WRITES INTO TB GROUP 0
U 11C1, 0000,003C,D580,0800,0084,733E  ;2707          SC_K[.6]                     ; CHECK THE WRITE PULSE BIT IN TBER0
U 133E, 0003,003C,0180,09F0,0000,133F  ;2708          RC[0E]_0
U 133F, 0001,2024,0180,0800,0010,1340  ;2709          ALU_Q.ANDNOT.MASK,CLK.UBCC
U 1340, 0000,013C,0180,0800,0000,11C2  ;2710          Z?
```

```
U 11C2, 0001,203D,0180,09E8,0000,1219   =0      RC[0D]_Q,ERROR1          ; WRITE PULSE BIT IN TBER0 INCORRECT
U 11C3, 0000,003C,0180,0800,0000,1341           NOP
                                        ;///////////////////////////////////////////////////////////
                                        : [7]   READ VA=4CCCC000 AND CHECK FOR MISS IN BOTH GROUPS
                                        :
U 1341, 0010,0038,0180,0908,0200,1008           VA_RC[1]                 ; RC[1]=4CCCC000
U 1008, 0010,0039,0180,09D0,0000,1242   =00     RC[0A]_LC,CALL,J/MISS    ; MISS CHECKS FOR TB MISS IN BOTH GROUPS
U 1009, 0000,003D,0180,0800,0000,1219           ERROR1         ; NO TRAP OCCURRED.
U 100A, 0000,003D,0180,0800,0000,1219           ERROR1         ; UTRAPPED BUT NOT TB MISS TRAP.
U 100B, 0000,003C,0180,0000,0000,1342           FS/MCT,MCT/TEST.RCHK     ; TEST BEN/TB.TEST
U 1342, 0000,1D3C,0180,0800,0000,10DC           BEN/TB.TEST              ; TEST INSTRUCTION FOR BRANCH TB.TEST
U 10DC, 0000,003D,0180,0800,0000,1219   =11100  ERROR1                   ; BRANCH WENT TO WRONG ADDRESS
U 10DD, 0000,003D,0180,0800,0000,1219           ERROR1
U 10DE, 0000,003D,0180,0800,0000,1219           ERROR1
U 10DF, 0000,003C,0180,0800,0000,1343           NOP
                                        ;///////////////////////////////////////////////////////////
                                        : [8]   READ
                                        :               VA=33330000
                                        :       CHECK FOR HIT IN GROUP 0
                                        :       AND CHECK RELOCATED ADDRESS (AS IT APPEARS IN THE TIME OUT ADDRESS
                                        :       REGISTER:
                                        :               05555500
                                        :
U 1343, 0010,0038,0180,0938,0200,1344           VA_RC[7]                 ; RC[7]=33330000
U 1344, 0010,0038,0180,09D0,0000,1345           RC[0A]_LC
U 1345, 0000,003C,0180,0940,0000,1090           LC_RC[8]                 ; RC[8]=05555500
U 1090, 0010,0039,0180,0AB8,0000,124C   =000    R[7]_LC,CALL,J/HIT0      ; HIT0 CHECKS THE GROUP 0 HIT
U 1091, 0000,003D,0180,0800,0000,1219           ERROR1         ; A NON TB MISS UTRAP OCCURRED
U 1092, 0000,003D,0180,0800,0000,1219           ERROR1         ; A TB MISS UTRAP OCCURRED
U 1093, 0000,003D,0180,0800,0000,1219           ERROR1         ; NO UTRAP BUT HIT/MISS BIT INCORRECT
U 1094, 0000,003D,0180,0800,0000,1232           CALL,J/RELCHK            ; CHECK THE RELOCATED ADDRESS
U 1095, 0000,003D,0180,0800,0000,1219           ERROR1         ; A UTRAP OCCURRED
U 1096, 0000,003D,0180,0800,0000,1219           ERROR1         ; RELOCATION INCORRECT
U 1097, 0000,003C,0180,0800,0000,1346           NOP
                                        ;///////////////////////////////////////////////////////////
                                        : [9]   READ
                                        :               VA=55554000
                                        :       CHECK FOR HIT IN GROUP 1 AND CHECK THE RELOCATED
                                        :       ADDRESS (AS IT APPEARS IN THE TIME OUT ADDRESS REGISTER).
                                        :               0CCCCC80
                                        :
U 1346, 0010,0038,0180,0920,0200,1347           VA_RC[4]                 ; RC[4]=55554000
U 1347, 0010,0038,0180,09D0,0000,1348           RC[0A]_LC
U 1348, 0000,003C,0180,0928,0000,10A0           LC_RC[5]                 ; RC[5]=0CCCCC80
U 10A0, 0010,0039,0180,0AB8,0000,1258   =000    R[7]_LC,CALL,J/HIT1      ; HIT1 CHECKS FOR A HIT IN GROUP 1
U 10A1, 0000,003D,0180,0800,0000,1219           ERROR1         ; A NON TB MISS TRAP OCCURRED.
U 10A2, 0000,003D,0180,0800,0000,1219           ERROR1         ; A TB MISS TRAP OCCURRED.
U 10A3, 0000,003D,0180,0800,0000,1219           ERROR1         ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 10A4, 0000,003D,0180,0800,0000,1232           CALL,J/RELCHK            ; CHECK THE RELOCATED ADDRESS
U 10A5, 0000,003D,0180,0800,0000,1219           ERROR1         ; A TRAP OCCURRED.
U 10A6, 0000,003D,0180,0800,0000,1219           ERROR1         ; NO UTRAP BUT RELOCATION INCORRECT.
U 10A7, 0000,003C,0180,0800,0000,1349           NOP
                                        ;///////////////////////////////////////////////////////////
                                        : [A]   WRITE INTO GROUP 1:
                                        :               VA=2AAA8000
                                        ;2766   :               PTE=A4066666
                                        ;2767   :       AND CHECK WRITE PULSE IN TBERO
                                        ;2768   :
U 1349, 0000,003C,0180,0A08,0200,134A   ;2769           VA_R[1]                 ; R[1]=2AAA8000
U 134A, 0000,003C,0180,09D0,0000,134B   ;2770           RC[OA]_LA
U 134B, 0000,003C,0180,0A00,0000,11C4   ;2771           LAB_R[0]                ; R[0]=A4066666
U 11C4, 0000,003D,0180,0AC0,0000,1024   ;2772   =0      R[8]_LA,CALL,J/TBWR1    ; WRITE INTO GROUP 1
U 11C5, 0000,003C,D580,0800,0084,734C   ;2773           SC_K[.6]                ; CHECK THE WRITE PULSE BIT IN TBERO
U 134C, 0003,001C,0180,09F0,0000,134D   ;2774           ALU_NOT.MASK,RC[OE]_ALU
U 134D, 0001,2024,0180,0800,0010,134E   ;2775           ALU_Q.ANDNOT.MASK,C[K.UBCC
U 134E, 0000,013C,0180,0800,0000,11C6   ;2776           Z?
U 11C6, 0000,003C,0180,0800,0000,134F   ;2777   =0      J/TBWPC
U 11C7, 0001,203D,0180,09E8,0000,1219   ;2778           ERROR1,RC[OD]_Q         ; TBERO WRITE PULSE BIT INCORRECT
                                        ;2779   ;////////////////////7//////////////////////////////////////////
                                        ;2780   : [B]   READ VA=55554000 AND CHECK FOR MISS IN BOTH GROUPS
                                        ;2781   :
U 134F, 0010,0038,0180,0920,0200,1010   ;2782   TBWPC:  VA_RC[4]                ; RC[4]=55554000
U 1010, 0010,0039,0180,09D0,0000,1242   ;2783   =00     RC[OA]_LC,CALL,J/MISS   ; CHECK MISS IN BOTH GROUPS
U 1011, 0000,003D,0180,0800,0000,1219   ;2784           ERROR1          ; NO TRAP OCCURRED.
U 1012, 0000,003D,0180,0800,0000,1219   ;2785           ERROR1          ; UTRAPPED BUT NOT TB MISS TRAP.
U 1013, 0000,003C,0180,0000,0000,1350   ;2786           FS/MCT,MCT/TEST.RCHK    ; CHECK TB.TEST BRANCH
U 1350, 0000,1D3C,0180,0800,0000,10FC   ;2787           BEN/TB.TEST             ; TEST INSTRUCTION
U 10FC, 0000,003D,0180,0800,0000,1219   ;2788   =11100  ERROR1                  ; BRANCH WENT TO WRONG ADDRESS
J 10FD, 0000,003D,0180,0800,0000,1219   ;2789           ERROR1
U 10FE, 0000,003D,0180,0800,0000,1219   ;2790           ERROR1
U 1OFF, 0000,003C,0180,0800,0000,1351   ;2791           NOP
                                        ;2792   ;///////////////////////////////////////////////////////////////
                                        ;2793   : [C]   READ
                                        ;2794   :               VA=33330000
                                        ;2795   :       CHECK FOR HIT IN GROUP 0 AND RELOCATED ADDRESS (AS IT APPEARS
                                        ;2796   :       IN THE TIME OUT ADDRESS REGISTER)
                                        ;2797   :               05555500
                                        ;2798   :
U 1351, 0010,0038,0180,0938,0200,1352   ;2799           VA_RC[7]                ; RC[7]=33330000
U 1352, 0010,0038,0180,09D0,0000,1353   ;2800           RC[OA]_LC
U 1353, 0000,003C,0180,0940,0000,10A8   ;2801           LC_RC[8]                ; RC[8]=05555500
U 10A8, 0010,0039,0180,0AB8,0000,124C   ;2802   =000    R[7]_LC,CALL,J/HITO     ; CHECK THE HIT IN GROUP 0
U 10A9, 0000,003D,0180,0800,0000,1219   ;2803           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 10AA, 0000,003D,0180,0800,0000,1219   ;2804           ERROR1          ; A TB MISS TRAP OCCURRED.
U 10AB, 0000,003D,0180,0800,0000,1219   ;2805           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 10AC, 0000,003D,0180,0800,0000,1232   ;2806           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 10AD, 0000,003D,0180,0800,0000,1219   ;2807           ERROR1          ; A TRAP OCCURRED.
U 10AE, 0000,003D,0180,0800,0000,1219   ;2808           ERROR1          ; NO UTRAP BUT RELOCATION INCORRECT.
U 10AF, 0000,003C,0180,0800,0000,1354   ;2809           NOP
                                        ;2810   ;///////////////////////////////////////////////////////////////
                                        ;2811   : [D]   READ
                                        ;2812   :               VA=2AAA8000
                                        ;2813   :       CHECK THE HIT IN GROUP 1 AND THE RELOCATED ADDRESS (AS IT
                                        ;2814   :       APPEARS IN THE TIME OUT ADDRESS REGISTER):
                                        ;2815   :               03333300
                                        ;2816   :
U 1354, 0000,003C,0180,0A08,0200,1355   ;2817           VA_R[1]                 ; R[1]=2AAA8000
U 1355, 0000,003C,0180,09D0,0000,1356   ;2818           RC[OA]_LA
U 1356, 0000,003C,0180,0A10,0000,10B0   ;2819           LAB_R[2]                ; R[2]=03333300
U 10B0, 0000,003D,0180,0AB8,0000,1258   ;2820   =000    R[7]_LA,CALL,J/HIT1     ; CHECK THE GROUP 1 HIT
```

```
U 10B1, 0000,003D,0180,0800,0000,1219   ;2821           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 10B2, 0000,003D,0180,0800,0000,1219   ;2822           ERROR1          ; A TB MISS TRAP OCCURRED.
U 10B3, 0000,003D,0180,0800,0000,1219   ;2823           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 10B4, 0000,003D,0180,0800,0000,1232   ;2824           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 10B5, 0000,003D,0180,0800,0000,1219   ;2825           ERROR1          ; A TRAP OCCURRED.
U 10B6, 0000,003D,0180,0800,0000,1219   ;2826           ERROR1          ; NO UTRAP BUT RELOCATION INCORRECT.
U 10B7, 0000,003C,0180,0800,0000,1357   ;2827           NOP
                                        ;2828   ;//////////////////////////////////////////////////////////////
                                        ;2829   ; [E]   WRITE INTO BOTH GROUPS:
                                        ;2830   ;               VA=4CCCC000
                                        ;2831   ;               PTE=A4155555
                                        ;2832   ;
U 1357, 0010,0038,0180,0908,0200,1358   ;2833           VA_RC[1]                ; RC[1]=4CCCC000
U 1358, 0010,0038,0180,09D0,0000,1359   ;2834           RC[0A]_LC
U 1359, 0000,003C,0180,0900,0000,11C8   ;2835           LC_RC[0]                ; RC[0]=A4155555
U 11C8, 0010,0039,0180,0AC0,0000,1044   ;2836   =0      R[8]_LC,CALL,J/TBWRB    ; WRITE BOTH GROUPS
U 11C9, 0000,003C,0180,0800,0000,135A   ;2837           NOP
                                        ;2838   ;//////////////////////////////////////////////////////////////
                                        ;2839   ; [F]   READ
                                        ;2840   ;               VA=33330000
                                        ;2841   ;       AND CHECK FOR MISS IN BOTH GROUPS
                                        ;2842   ;
U 135A, 0010,0038,0180,0938,0200,1018   ;2843   TBWPD:  VA_RC[7]                ; RC[7]=33330000
U 1018, 0010,0039,0180,09D0,0000,1242   ;2844   =00     RC[0A]_LC,CALL,J/MISS   ; CHECK FOR TB MISS
U 1019, 0000,003D,0180,0800,0000,1219   ;2845           ERROR1          ; NO TRAP OCCURRED.
U 101A, 0000,003D,0180,0800,0000,1219   ;2846           ERROR1          ; UTRAPPED BUT NOT TB MISS TRAP.
U 101B, 0000,003C,0180,0800,0000,135B   ;2847           NOP
                                        ;2848   ;//////////////////////////////////////////////////////////////
                                        ;2849   ; [10]  READ
                                        ;2850   ;               VA=2AAA8000
                                        ;2851   ;       AND CHECK FOR MISS IN BOTH GROUPS
                                        ;2852   ;
U 135B, 0000,003C,0180,0A08,0200,1020   ;2853           VA_R[1]                 ; R[1]=2AAA8000
U 1020, 0000,003D,0180,09D0,0000,1242   ;2854   =00     RC[0A]_LA,CALL,J/MISS   ; READ MISS IN BOTH GROUPS
U 1021, 0000,003D,0180,0800,0000,1219   ;2855           ERROR1          ; NO TRAP OCCURRED.
U 1022, 0000,003D,0180,0800,0000,1219   ;2856           ERROR1          ; UTRAPPED BUT NOT TB MISS TRAP.
U 1023, 0000,003C,0180,0800,0000,135C   ;2857           NOP
                                        ;2858   ;//////////////////////////////////////////////////////////////
                                        ;2859   ; [11]  READ
                                        ;2860   ;               VA=4CCCC000
                                        ;2861   ;       CHECK FOR HIT IN GROUP 0 AND RELOCATED ADDRESS (AS IT APPEARS
                                        ;2862   ;       IN THE TIME OUT ADDRESS REGISTER)
                                        ;2863   ;               0AAAAA80
                                        ;2864   ;
U 135C, 0010,0038,0180,0908,0200,135D   ;2865           VA_RC[1]                ; RC[1]=4CCCC000
U 135D, 0010,0038,0180,09D0,0000,135E   ;2866           RC[0A]_LC
U 135E, 0000,003C,0180,0910,0000,10C0   ;2867           LC_RC[2]                ; RC[2]=0AAAAA80
U 10C0, 0010,0039,0180,0AB8,0000,124C   ;2868   =000    R[7]_LC,CALL,J/HIT0     ; CHECK GROUP 0 HIT
U 10C1, 0000,003D,0180,0800,0000,1219   ;2869           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 10C2, 0000,003D,0180,0800,0000,1219   ;2870           ERROR1          ; A TB MISS TRAP OCCURRED.
U 10C3, 0000,003D,0180,0800,0000,1219   ;2871           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 10C4, 0000,003D,0180,0800,0000,1232   ;2872           CALL,J/RELCHK           ; CHECK RELOCATED ADDRESS
U 10C5, 0000,003D,0180,0800,0000,1219   ;2873           ERROR1          ; A TRAP OCCURRED.
U 10C6, 0000,003D,0180,0800,0000,1219   ;2874           ERROR1          ; NO UTRAP BUT RELOCATION INCORRECT.
U 10C7, 0000,003C,0180,0800,0000,135F   ;2875           NOP
```

```
                                        ;//////////////////////////////////////////////////////////////
                                        ; [12]  WRITE INTO GROUP 0
                                        ;               VA=33330000
                                        ;               PTE=A40AAAAA
                                        ;
U 135F, 0010,0038,0180,0938,0200,1360           VA_RC[7]                ; RC[7]=33330000
U 1360, 0010,0038,0180,09D0,0000,1361           RC[0A]_LC
U 1361, 0000,003C,0180,0930,0000,11CA           LC_RC[6]                ; RC[6]=A40AAAAA
U 11CA, 0010,0039,0180,0AC0,0000,103C   =0      R[8]_LC,CALL,J/TBWR0    ; WRITE GROUP 0
U 11CB, 0000,003C,D580,0800,0084,7362           SC_K[.6]                ; TEST WRITE PULSE BIT IN TBER0
U 1362, 0003,003C,0180,09F0,0000,1363           RC[0E]_0
U 1363, 0001,2024,0180,0800,0010,1364           ALU_Q.ANDNOT.MASK,CLK.UBCC
U 1364, 0000,013C,0180,0800,0000,11CC           Z?
U 11CC, 0001,203D,0180,09E8,0000,1219   =0      ERROR1,RC[0D]_Q         ; TBER0 WRITE PULSE BIT INCORRECT
                                        ;//////////////////////////////////////////////////////////////
                                        ; [13]  READ
                                        ;               VA=4CCCC000
                                        ;       CHECK FOR HIT IN GROUP 1 AND RELOCATED ADDRESS (AS IT APPEARS
                                        ;       IN THE TIME OUT ADDRESS REGISTER)
                                        ;               0AAAAA80
                                        ;
U 11CD, 0010,0038,0180,0908,0200,1365   TBWPX:  VA_RC[1]                ; RC[1]=4CCCC000
U 1365, 0010,0038,0180,09D0,0000,1366           RC[0A]_LC
U 1366, 0000,003C,0180,0910,0000,10C8           LC_RC[2]                ; RC[2]=0AAAAA80
U 10C8, 0010,0039,0180,0AB8,0000,1258   =000    R[7]_LC,CALL,J/HIT1     ; CHECK FOR GROUP 1 HIT
U 10C9, 0000,003D,0180,0800,0000,1219           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 10CA, 0000,003D,0180,0800,0000,1219           ERROR1          ; A TB MISS TRAP OCCURRED.
U 10CB, 0000,003D,0180,0800,0000,1219           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 10CC, 0000,003D,0180,0800,0000,1232           CALL,J/RELCHK           ; CHECK FOR RELOCATED ADDRESS
U 10CD, 0000,003D,0180,0800,0000,1219           ERROR1          ; A TRAP OCCURRED.
U 10CE, 0000,003D,0180,0800,0000,1219           ERROR1          ; NO UTRAP BUT RELOCATION INCORRECT.
U 10CF, 0000,003C,0180,0800,0000,1367           NOP
                                        ;//////////////////////////////////////////////////////////////
                                        ; [14]  READ
                                        ;               VA=33330000
                                        ;       CHECK FOR HIT IN GROUP 0 AND RELOCATED ADDRESS (AS IT
                                        ;       APPEARS IN THE TIME OUT ADDRESS REGISTER)
                                        ;               05555500
                                        ;
U 1367, 0010,0038,0180,0938,0200,1368           VA_RC[7]                ; RC[7]=33330000
U 1368, 0010,0038,0180,09D0,0000,1369           RC[0A]_LC
U 1369, 0000,003C,0180,0940,0000,10D0           LC_RC[8]                ; RC[8]=05555500
U 10D0, 0010,0039,0180,0AB8,0000,124C   =000    R[7]_LC,CALL,J/HIT0     ; CHECK FOR HIT IN GROUP 0
U 10D1, 0000,003D,0180,0800,0000,1219           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 10D2, 0000,003D,0180,0800,0000,1219           ERROR1          ; A TB MISS TRAP OCCURRED.
U 10D3, 0000,003D,0180,0800,0000,1219           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 10D4, 0000,003D,0180,0800,0000,1232           CALL,J/RELCHK           ; CHECK FOR RELOCATED ADDRESS
U 10D5, 0000,003D,0180,0800,0000,1219           ERROR1          ; A TRAP OCCURRED.
U 10D6, 0000,003D,0180,0800,0000,1219           ERROR1          ; NO UTRAP BUT RELOCATION INCORRECT.
U 10D7, 0000,003C,0180,0800,0000,136A           NOP
                                        ;//////////////////////////////////////////////////////////////
                                        ; [15]  WRITE INTO A RANDOM TB GROUP
                                        ;               VA=55554000
                                        ;               PTE=A4199999
                                        ;
```

```
U 136A, 0010,0038,0180,0920,0200,136B   ;2931           VA_RC[4]                    ; RC[4]=55554000
U 136B, 0010,0038,0180,09D0,0000,136C   ;2932           RC[0A]_LC
U 136C, 0000,003C,0180,0918,0000,11CE   ;2933           LC_RC[3]                    ; RC[3]=A4199999
U 11CE, 0010,0039,0180,0AC0,0000,122E   ;2934     =0    R[8]_LC,CALL,J/TBWRAN       ; PERFORM WRITE RANDOM FUNCTION
                                        ;2935     ;////////////////////////////////////////////////////////////
                                        ;2936     ; [16]  WRITE INTO A RANDOM TB GROUP
                                        ;2937     ;               VA=2AAA8000
                                        ;2938     ;               PTE=A4066666
                                        ;2939     ;       NOTE THIS WRITE SHOULD BE INTO A DIFFERENT
                                        ;2940     ;       GROUP THAN THE GROUP WHICH WAS WRITTEN INTO BY STEP 21. ABOVE
                                        ;2941     ;
U 11CF, 0000,003C,0180,0A08,0200,136D   ;2942           VA_R[1]                     ; R[1]=2AAA8000
U 136D, 0000,003C,0180,0A00,0000,11D0   ;2943           LAB_R[0]                    ; R[0]=A4066666
U 11D0, 0000,003D,0180,0AC0,0000,122E   ;2944     =0    R[8]_LA,CALL,J/TBWRAN       ; WRITE INTO TB RANDOMLY
U 11D1, 0001,203C,0180,0A98,0000,136E   ;2945           R[3]_Q                      ; SAVE CONTENTS OF TBERO
                                        ;2946                                       ; SO THAT WRITE PULSE BIT CAN BE
                                        ;2947                                       ; USED TO DETERMINE WHICH GROUP
                                        ;2948                                       ; WAS WRITTEN WITH WHICH DATA
                                        ;2949                                       ; PATTERNS.
                                        ;2950     ;////////////////////////////////////////////////////////////
                                        ;2951     ;       READ VA=4CCCC000 AND CHECK FOR MISS IN BOTH GROUPS
                                        ;2952     ;
U 136E, 0010,0038,0180,0908,0200,1028   ;2953           VA_RC[1]                    ; RC[1]=4CCCC000
U 1028, 0010,0039,0180,09D0,0000,1242   ;2954     =00   RC[0A]_LC,CALL,J/MISS       ; CHECK FOR MISS IN BOTH GROUPS
U 1029, 0000,003D,0180,0800,0000,1219   ;2955           ERROR1          ; NO TRAP OCCURRED.
U 102A, 0000,003D,0180,0800,0000,1219   ;2956           ERROR1          ; UTRAPPED BUT NOT TB MISS TRAP.
U 102B, 0000,003C,0180,0800,0000,136F   ;2957           NOP
                                        ;2958     ;////////////////////////////////////////////////////////////
                                        ;2959     ;       READ VA=33330000 AND CHECK FOR MISS IN BOTH GROUPS
                                        ;2960     ;
U 136F, 0010,0038,0180,0938,0200,1030   ;2961           VA_RC[7]                    ; RC[7]=33330000
U 1030, 0010,0039,0180,09D0,0000,1242   ;2962     =00   RC[0A]_LC,CALL,J/MISS       ; READ MISS IN BOTH GROUPS
U 1031, 0000,003D,0180,0800,0000,1219   ;2963           ERROR1          ; NO TRAP OCCURRED.
U 1032, 0000,003D,0180,0800,0000,1219   ;2964           ERROR1          ; UTRAPPED BUT NOT TB MISS TRAP.
U 1033, 0000,003C,0180,0800,0000,1370   ;2965           NOP
                                        ;2966     ;////////////////////////////////////////////////////////////
                                        ;2967     ; [17]
                                        ;2968     ; [18]
                                        ;2969     ;
                                        ;2970     ;       FIRST DETERMINE WHICH GROUP GOT WRITTEN WITH WHICH DATA PATTERN
                                        ;2971     ;       AND THEN CHECK THE TWO HITS AND TWO RELOCATED ADDRESSES.
                                        ;2972     ;
U 1370, 0000,003C,01C0,0A18,0000,1371   ;2973           Q_R[3]                      ; CHECK SAVED COPY OF TBERO
U 1371, 0000,003C,D580,0800,0084,7372   ;2974           SC_K[.6]
U 1372, 0001,2024,0180,0800,0010,1373   ;2975           ALU_Q.ANDNOT.MASK,CLK.UBCC
U 1373, 0000,013C,0180,0800,0000,11D2   ;2976           Z?
U 11D2, 0000,003C,0180,0800,0000,137A   ;2977     =0    J/TBWPF
U 11D3, 0000,003C,0180,0800,0000,1374   ;2978           NOP
                                        ;2979     ;////////////////////////////////////////////////////////////
                                        ;2980     ;       FIRST WRITE WENT TO GROUP 1, SECOND TO GROUP 0
                                        ;2981     ;
                                        ;2982     ;       READ
                                        ;2983     ;               VA=2AAA8000
                                        ;2984     ;       CHECK FOR HIT IN GROUP 0 AND RELOCATED ADDRESS
                                        ;2985     ;               03333300
```

```
                                         ;2986    ;
U 1374, 0000,003C,0180,0A08,0200,1375    ;2987              VA_R[1]                    ; R[1]=2AAA8000
U 1375, 0000,003C,0180,09D0,0000,1376    ;2988              RC[0A]_LA
U 1376, 0000,003C,0180,0A10,0000,10E0    ;2989              LAB_R[2]                   ; R[2]=03333300
U 10E0, 0000,003D,0180,0AB8,0000,124C    ;2990    =000      R[7]_LA,CALL,J/HIT0        ; CHECK GROUP 0 HIT
U 10E1, 0000,003D,0180,0800,0000,1219    ;2991              ERROR1           ; A NON TB MISS TRAP OCCURRED.
U 10E2, 0000,003D,0180,0800,0000,1219    ;2992              ERROR1           ; A TB MISS TRAP OCCURRED.
U 10E3, 0000,003D,0180,0800,0000,1219    ;2993              ERROR1           ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 10E4, 0000,003D,0180,0800,0000,1232    ;2994              CALL,J/RELCHK              ; CHECK THE RELOCATED ADDRESS
U 10E5, 0000,003D,0180,0800,0000,1219    ;2995              ERROR1           ; A TRAP OCCURRED.
U 10E6, 0000,003D,0180,0800,0000,1219    ;2996              ERROR1           ; NO UTRAP BUT RELOCATION INCORRECT.
U 10E7, 0000,003C,0180,0800,0000,1377    ;2997              NOP
                                         ;2998    ;         READ
                                         ;2999    ;                 VA=55554000
                                         ;3000    ;         CHECK THE HIT IN GROUP 1 AND THE RELOCATED ADDRESS
                                         ;3001    ;                 0CCCCC80
U 1377, 0010,0038,0180,0920,0200,1378    ;3002              VA_RC[4]                   ; RC[4]=55554000
U 1378, 0010,0038,0180,09D0,0000,1379    ;3003              RC[0A]_LC
U 1379, 0000,003C,0180,0928,0000,10E8    ;3004              LC_RC[5]                   ; RC[5]=0CCCCC80
U 10E8, 0010,0039,0180,0AB8,0000,1258    ;3005    =000      R[7]_LC,CALL,J/HIT1        ; CHECK THE GROUP 1 HIT
U 10E9, 0000,003D,0180,0800,0000,1219    ;3006              ERROR1           ; A NON TB MISS TRAP OCCURRED.
U 10EA, 0000,003D,0180,0800,0000,1219    ;3007              ERROR1           ; A TB MISS TRAP OCCURRED.
U 10EB, 0000,003D,0180,0800,0000,1219    ;3008              ERROR1           ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 10EC, 0000,003D,0180,0800,0000,1232    ;3009              CALL,J/RELCHK              ; CHECK THE RELOCATED ADDRESS
U 10ED, 0000,003D,0180,0800,0000,1219    ;3010              ERROR1           ; A TRAP OCCURRED.
U 10EE, 0000,003D,0180,0800,0000,1219    ;3011              ERROR1           ; NO UTRAP BUT RELOCATION INCORRECT.
U 10EF, 0000,003C,0180,0800,0000,1117    ;3012              J/TBWPG
                                         ;3013    ;//////////////////////////////////////////////////////////////
                                         ;3014    ;         THE FIRST WRITE WENT TO GROUP 0, THE SECOND TO GROUP 1.
                                         ;3015    ;
                                         ;3016    ;         READ
                                         ;3017    ;                 VA=2AAA80C0
                                         ;3018    ;         CHECK FOR HIT IN GROUP 1 AND RELOCATED ADDRESS
                                         ;3019    ;                 03333300
                                         ;3020    ;
U 137A, 0000,003C,0180,0A08,0200,137B    ;3021    TBWPF:    VA_R[1]                    ; R[1]=2AAA8000
U 137B, 0000,003C,0180,09D0,0000,137C    ;3022              RC[0A]_LA
U 137C, 0000,003C,0180,0A10,0000,10F0    ;3023              LAB_R[2]                   ; R[2]=03333300
U 10F0, 0000,003D,0180,0AB8,0000,1258    ;3024    =000      R[7]_LA,CALL,J/HIT1        ; CHECK FOR HIT IN GROUP 1
U 10F1, 0000,003D,0180,0800,0000,1219    ;3025              ERROR1           ; A NON TB MISS TRAP OCCURRED.
U 10F2, 0000,003D,0180,0800,0000,1219    ;3026              ERROR1           ; A TB MISS TRAP OCCURRED.
U 10F3, 0000,003D,0180,0800,0000,1219    ;3027              ERROR1           ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 10F4, 0000,003D,0180,0800,0000,1232    ;3028              CALL,J/RELCHK              ; CHECK THE RELOCATED ADDRESS
U 10F5, 0000,003D,0180,0800,0000,1219    ;3029              ERROR1           ; A TRAP OCCURRED.
U 10F6, 0000,003D,0180,0800,0000,1219    ;3030              ERROR1           ; NO UTRAP BUT RELOCATION INCORRECT.
U 10F7, 0000,003C,0180,0800,0000,137D    ;3031              NOP
                                         ;3032    ;         READ
                                         ;3033    ;                 VA=55554000
                                         ;3034    ;         CHECK FOR HIT IN GROUP 0 AND RELOCATED ADDRESS
                                         ;3035    ;                 0CCCCC80
                                         ;3036    ;
U 137D, 0010,0038,0180,0920,0200,137E    ;3037              VA_RC[4]                   ; RC[4]=55554000
U 137E, 0010,0038,0180,09D0,0000,137F    ;3038              RC[0A]_LC
U 137F, 0000,003C,0180,0928,0000,1110    ;3039              LC_RC[5]                   ; RC[5]=0CCCCC80
U 1110, 0010,0039,0180,0AB8,0000,124C    ;3040    =000      R[7]_LC,CALL,J/HIT0        ; CHECK FOR HIT IN GROUP 0
```

```
U 1111, 0000,003D,0180,0800,0000,1219   ;3041           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1112, 0000,003D,0180,0800,0000,1219   ;3042           ERROR1          ; A TB MISS TRAP OCCURRED.
U 1113, 0000,003D,0180,0800,0000,1219   ;3043           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1114, 0000,003D,0180,0800,0000,1232   ;3044           CALL,J/RELCHK           ; CHECK RELOCATED ADDRESS
U 1115, 0000,003D,0180,0800,0000,1219   ;3045           ERROR1          ; A TRAP OCCURRED.
U 1116, 0000,003D,0180,0800,0000,1219   ;3046           ERROR1          ; NO UTRAP BUT RELOCATION INCORRECT.
U 1117, 0000,003C,0180,0800,0000,11D4   ;3047   TBWPG:  NOP
                                        ;3048   ;/////////////////////////////////////////////////////////////
                                        ;3049   ; [19]  WRITE INTO GROUP 1
                                        ;3050   ;               VA=4CCCC000
                                        ;3051   ;               PTE=A4155555
                                        ;3052   ;
U 11D4, 0000,003D,0180,0800,0000,1218   ;3053   =0      ERLOOP
U 11D5, 0010,0038,0180,0908,0200,1380   ;3054           VA_RC[1]                ; RC[1]=4CCCC000
U 1380, 0000,003C,0180,0900,0000,11D6   ;3055           LC_RC[0]                ; RC[0]=A4155555
U 11D6, 0010,0039,0180,0AC0,0000,1024   ;3056   =0      R[8]_LC,CALL,J/TBWR1    ; WRITE INTO GROUP 1
                                        ;3057   ;/////////////////////////////////////////////////////////////
                                        ;3058   ; [1A]  WRITE INTO GROUP 0
                                        ;3059   ;               VA=33330000
                                        ;3060   ;               PTE=A40AAAAA
                                        ;3061   ;
U 11D7, 0010,0038,0180,0938,0200,1381   ;3062           VA_RC[7]                ; RC[7]=33330000
U 1381, 0000,003C,0180,0930,0000,11D8   ;3063           LC_RC[6]                ; RC[6]=A40AAAAA
U 11D8, 0010,0039,0180,0AC0,0000,103C   ;3064   =0      R[8]_LC,CALL,J/TBWR0    ; WRITE INTO GROUP 0
                                        ;3065   ;/////////////////////////////////////////////////////////////
                                        ;3066   ; [1B]  WRITE
                                        ;3067   ;               VA=4CCCC000
                                        ;3068   ;               PTE=A4199999
                                        ;3069   ;       4CCCC000 IS A HIT IN GROUP 1 SO GROUP 1 SHOULD BE WRITTEN
                                        ;3070   ;       EVEN IF THE FORCE REPLACE GROUP 0 BIT IS SET.
                                        ;3071   ;
U 11D9, 0010,0038,0180,0908,0200,1382   ;3072           VA_RC[1]                ; RC[1]=4CCCC000
U 1382, 0000,003C,0180,0918,0000,11DA   ;3073           LC_RC[3]                ; RC[3]=A4199999
U 11DA, 0010,0039,0180,0AC0,0000,103C   ;3074   =0      R[8]_LC,CALL,J/TBWR0    ; THIS SHOULD WRITE ONLY GROUP 1        NOP
                                        ;3075   ;/////////////////////////////////////////////////////////////
                                        ;3076   ; [1C]  READ
                                        ;3077   ;               VA=33330000
                                        ;3078   ;       CHECK FOR HIT IN GROUP 0 AND CHECK
                                        ;3079   ;       THE RELOCATED ADDRESS
                                        ;3080   ;               05555500
                                        ;3081   ;
U 11DB, 0010,0038,0180,0938,0200,1383   ;3082           VA_RC[7]                ; RC[7]=33330000
U 1383, 0010,0038,0180,09D0,0000,1384   ;3083           RC[0A]_LC
U 1384, 0000,003C,0180,0940,0000,1118   ;3084           LC_RC[8]                ; RC[8]=05555500
U 1118, 0010,0039,0180,0AB8,0000,124C   ;3085   =000    R[7]_LC,CALL,J/HIT0     ; CHECK FOR A HIT IN GROUP 0
U 1119, 0000,003D,0180,0800,0000,1219   ;3086           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 111A, 0000,003D,0180,0800,0000,1219   ;3087           ERROR1          ; A TB MISS TRAP OCCURRED.
U 111B, 0000,003D,0180,0800,0000,1219   ;3088           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 111C, 0000,003D,0180,0800,0000,1232   ;3089           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 111D, 0000,003D,0180,0800,0000,1219   ;3090           ERROR1          ; A TRAP OCCURRED.
U 111E, 0000,003D,0180,0800,0000,1219   ;3091           ERROR1          ; NO UTRAP BUT RELOCATION INCORRECT.
U 111F, 0000,003C,0180,0800,0000,1385   ;3092           NOP
                                        ;3093   ;/////////////////////////////////////////////////////////////
                                        ;3094   ; [1D]  READ
                                        ;3095   ;               VA=4CCCC000
```

```
                                         ;3096    :       CHECK FOR A HIT IN GROUP 1 AND CHECK THE
                                         ;3097    :       RELOCATED ADDRESS
                                         ;3098    :               0CCCC800
                                         ;3099    :
U 1385, 0010,0038,0180,0908,0200,1386    ;3100            VA_RC[1]                 ; RC[1]=4CCCC000
U 1386, 0010,0038,0180,09D0,0000,1387    ;3101            RC[0A]_LC
U 1387, 0000,003C,0180,0928,0000,1120    ;3102            LC_RC[5]                 ; RC[5]=0CCCC800
U 1120, 0010,0039,0180,0AB8,0000,1258    ;3103    =000    R[7]_LC,CALL,J/HIT1      ; CHECK FOR A HIT IN GROUP 1
U 1121, 0000,003D,0180,0800,0000,1219    ;3104            ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1122, 0000,003D,0180,0800,0000,1219    ;3105            ERROR1          ; A TB MISS TRAP OCCURRED.
U 1123, 0000,003D,0180,0800,0000,1219    ;3106            ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1124, 0000,003D,0180,0800,0000,1232    ;3107            CALL,J/RELCHK            ; CHECK THE RELOCATED ADDRESS
U 1125, 0000,003D,0180,0800,0000,1219    ;3108            ERROR1          ; A TRAP OCCURRED.
U 1126, 0000,003D,0180,0800,0000,1219    ;3109            ERROR1          ; NO UTRAP BUT RELOCATION INCORRECT.
U 1127, 0000,003C,0180,0800,0000,1388    ;3110            NOP
                                         ;3111    ;//////////////////////////////////////////////////////////////
                                         ;3112    : [1E]  WRITE
                                         ;3113    :               VA=33330000
                                         ;3114    :               PTE=A4066666
                                         ;3115    :       33330000 IS A HIT IN GROUP 0 SO THIS SHOULD WRITE INTO
                                         ;3116    :       GROUP 0 EVEN IF THE REPLACE GROUP 1 BIT IS SET.
                                         ;3117    :
U 1388, 0010,0038,0180,0938,0200,1389    ;3118            VA_RC[7]                 ; RC[7]=3333000
U 1389, 0000,003C,0180,0A00,0000,11DC    ;3119            LAB_R[0]                 ; R[0]=A4066666
U 11DC, 0000,003D,0180,0AC0,0000,1024    ;3120    =0      R[8]_LA,CALL,J/TBWR1     ; SHOULD WRITE ONLY GROUP 0
U 11DD, 0000,003C,0180,0800,0000,138A    ;3121            NOP
                                         ;3122    ;//////////////////////////////////////////////////////////////
                                         ;3123    : [1F]  READ
                                         ;3124    :               VA=4CCCC000
                                         ;3125    :       CHECK FOR HIT IN GROUP 1 AND CHECK FOR RELOCATED ADDRESS
                                         ;3126    :               0CCCC800
                                         ;3127    :
U 138A, 0010,0038,0180,0908,0200,138B    ;3128            VA_RC[1]                 ; RC[1]=4CCCC000
U 138B, 0010,0038,0180,09D0,0000,138C    ;3129            RC[0A]_LC
U 138C, 0000,003C,0180,0928,0000,1128    ;3130            LC_RC[5]                 ; RC[5]=0CCCC800
U 1128, 0010,0039,0180,0AB8,0000,1258    ;3131    =000    R[7]_LC,CALL,J/HIT1      ; CHECK FOR HIT IN GROUP 1
U 1129, 0000,003D,0180,0800,0000,1219    ;3132            ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 112A, 0000,003D,0180,0800,0000,1219    ;3133            ERROR1          ; A TB MISS TRAP OCCURRED.
U 112B, 0000,003D,0180,0800,0000,1219    ;3134            ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 112C, 0000,003D,0180,0800,0000,1232    ;3135            CALL,J/RELCHK            ; CHECK THE RELOCATED ADDRESS
U 112D, 0000,003D,0180,0800,0000,1219    ;3136            ERROR1          ; A UTRAP OCCURRED.
U 112E, 0000,003D,0180,0800,0000,1219    ;3137            ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 112F, 0000,003C,0180,0800,0000,138D    ;3138            NOP
                                         ;3139    ;//////////////////////////////////////////////////////////////
                                         ;3140    : [20]  READ
                                         ;3141    :               VA=33330000
                                         ;3142    :       CHECK FOR HIT A GROUP 0 AND CHECK THE RELOCATED ADDRESS
                                         ;3143    :               03333300
                                         ;3144    :
U 138D, 0010,0038,0180,0938,0200,138E    ;3145            VA_RC[7]                 ; RC[7]=33330000
U 138E, 0010,0038,0180,09D0,0000,138F    ;3146            RC[0A]_LC
U 138F, 0000,003C,0180,0A10,0000,1130    ;3147            LAB_R[2]                 ; R[2]=03333300
U 1130, 0000,003D,0180,0AB8,0000,124C    ;3148    =000    R[7]_LA,CALL,J/HIT0      ; CHECK FOR HIT IN GROUP 0
U 1131, 0000,003D,0180,0800,0000,1219    ;3149            ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1132, 0000,003D,0180,0800,0000,1219    ;3150            ERROR1          ; A TB MISS TRAP OCCURRED.
```

```
U 1133, 0000,003D,0180,0800,0000,1219   ;3151           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1134, 0000,003D,0180,0800,0000,1232   ;3152           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 1135, 0000,003D,0180,0800,0000,1219   ;3153           ERROR1          ; A UTRAP OCCURRED.
U 1136, 0000,003D,0180,0800,0000,1219   ;3154           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1137, 0000,003C,0180,0800,0000,11DE   ;3155           NOP
                                        ;3156   ;//////////////////////////////////////////////////////////////
                                        ;3157   ; [21]  SET THE FORCE MISS BIT FOR GROUP 0
                                        ;3158   ;
U 11DE, 0000,003D,0180,0800,0000,1218   ;3159   =0      ERLOOP
U 11DF, 0000,003C,6580,0800,0084,7390   ;3160           SC_K[.10]
U 1390, 0803,001C,0180,0800,0000,1391   ;3161           ALU_NOT.MASK,D_ALU      ; D=10000
U 1391, 0819,0014,0580,0800,0000,1392   ;3162           D_D+K[.1]               ; D=10001
U 1392, 0000,003C,4980,3C00,0000,1393   ;3163           ID[TBER0]_D             ; SET FORCE MISS GROUP 0 BIT AND MME
                                        ;3164   ;//////////////////////////////////////////////////////////////
                                        ;3165   ; [22]  READ VA=33330000 AND CHECK FOR MISS IN BOTH GROUPS.
                                        ;3166   ;
U 1393, 0010,0038,0180,0938,0200,1038   ;3167           VA_RC[7]                ; RC[7]=33330000
U 1038, 0010,0039,0180,09D0,0000,1242   ;3168   =00     RC[0A]_LC,CALL,J/MISS   ; CHECK FOR TB MISS
U 1039, 0000,003D,0180,0800,0000,1219   ;3169           ERROR1          ; NO TRAP OCCURRED.
U 103A, 0000,003D,0180,0800,0000,1219   ;3170           ERROR1          ; UTRAPPED BUT NOT TB MISS TRAP.
U 103B, 0000,003C,0180,0800,0000,1394   ;3171           NOP
                                        ;3172   ;//////////////////////////////////////////////////////////////
                                        ;3173   ; [23]  CLEAR THE FORCE MISSES IN GROUP 0 BIT
                                        ;3174   ;
U 1394, 0818,0038,0580,0800,0000,1395   ;3175           D_K[.1]
U 1395, 0000,003C,4980,3C00,0000,1396   ;3176           ID[TBER0]_D             ; SET JUST MME
                                        ;3177   ;//////////////////////////////////////////////////////////////
                                        ;3178   ; [24]  READ
                                        ;3179   ;               VA=33330000
                                        ;3180   ;       CHECK FOR HIT INGROUP 0 AND CHECK THE RELOCATED ADDRESS
                                        ;3181   ;               03333300
                                        ;3182   ;
U 1396, 0010,0038,0180,0938,0200,1397   ;3183           VA_RC[7]                ; RC[7]=33330000
U 1397, 0010,0038,0180,09D0,0000,1398   ;3184           RC[0A]_LC
U 1398, 0000,003C,0180,0A10,0000,1138   ;3185           LAB_R[2]                ; R[2]=03333300
U 1138, 0000,003D,0180,0AB8,0000,124C   ;3186   =000    R[7]_LA,CALL,J/HIT0     ; CHECK FOR A HIT IN GROUP 0
U 1139, 0000,003D,0180,0800,0000,1219   ;3187           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 113A, 0000,003D,0180,0800,0000,1219   ;3188           ERROR1          ; A TB MISS TRAP OCCURRED.
U 113B, 0000,003D,0180,0800,0000,1219   ;3189           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 113C, 0000,003D,0180,0800,0000,1232   ;3190           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 113D, 0000,003D,0180,0800,0000,1219   ;3191           ERROR1          ; A UTRAP OCCURRED.
U 113E, 0000,003D,0180,0800,0000,1219   ;3192           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 113F, 0000,003C,0180,0800,0000,11E0   ;3193           NOP
                                        ;3194   ;//////////////////////////////////////////////////////////////
                                        ;3195   ; [25]  SET THE FORCE MISSES TO GROUP 1 BIT
                                        ;3196   ;
U 11E0, 0000,003D,0180,0800,0000,1218   ;3197   =0      ERLOOP
U 11E1, 0818,0038,6580,0800,0000,1399   ;3198           D_K[.10]
U 1399, 0819,0014,0580,0800,0082,139A   ;3199           D_D+K[.1],SC_ALU
U 139A, 0803,001C,0180,0800,0000,139B   ;3200           ALU_NOT.MASK,D_ALU      ; D=20000
U 139B, 0819,0014,0580,0800,0000,139C   ;3201           D_D+K[.1]               ; D=20001
U 139C, 0000,003C,4980,3C00,0000,139D   ;3202           ID[TBER0]_D             ; SET FORCE MISSES TO GROUP 0 BIT AND MME
                                        ;3203   ;//////////////////////////////////////////////////////////////
                                        ;3204   ; [26]  READ VA=4CCCC000 AND CHECK FOR MISS IN BOTH GROUPS
                                        ;3205   ;
```

```
U 139D, 0010,0038,0180,0908,0200,1040   ;3206           VA_RC[1]                ; RC[1]=4CCCC000
U 1040, 0010,0039,0180,09D0,0000,1242   ;3207   =00     RC[0A]_LC,CALL,J/MISS   ; SHOULD BE A MISS IN TB
U 1041, 0000,003D,0180,0800,0000,1219   ;3208           ERROR1          ; NO TRAP OCCURRED.
U 1042, 0000,003D,0180,0800,0000,1219   ;3209           ERROR1          ; UTRAPPED BUT NOT TB MISS TRAP.
U 1043, 0000,003C,0180,0800,0000,139E   ;3210           NOP
                                        ;3211   ;/////////////////////////////////////////////////////////////
                                        ;3212   ; [27]  CLEAR THE FORCE MISSES IN GROUP 1 BIT
                                        ;3213   ;
U 139E, 0818,0038,0580,0800,0000,139F   ;3214           D_K[.1]
U 139F, 0000,003C,4980,3C00,0000,13A0   ;3215           ID[TBER0]_D             ; SET JUST MME
                                        ;3216   ;/////////////////////////////////////////////////////////////
                                        ;3217   ; [28]  READ
                                        ;3218   ;               VA=4CCCC000
                                        ;3219   ;       CHECK FOR HIT IN GROUP 1 AND CHECK THE RELOCATED ADDRESS
                                        ;3220   ;               0CCCC800
U 13A0, 0010,0038,0180,0908,0200,13A1   ;3221           VA_RC[1]                ; RC[1]=4CCCC000
U 13A1, 0010,0038,0180,09D0,0000,13A2   ;3222           RC[0A]_LC
U 13A2, 0000,003C,0180,0928,0000,1140   ;3223           LC_RC[5]                ; RC[5]=0CCCC800
U 1140, 0010,0039,0180,0AB8,0000,1258   ;3224   =000    R[7]_LC,CALL,J/HIT1     ; CHECK FOR HIT IN GROUP 1
U 1141, 0000,003D,0180,0800,0000,1219   ;3225           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1142, 0000,003D,0180,0800,0000,1219   ;3226           ERROR1          ; A TB MISS TRAP OCCURRED.
U 1143, 0000,003D,0180,0800,0000,1219   ;3227           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1144, 0000,003D,0180,0800,0000,1232   ;3228           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 1145, 0000,003D,0180,0800,0000,1219   ;3229           ERROR1          ; A UTRAP OCCURRED.
U 1146, 0000,003D,0180,0800,0000,1219   ;3230           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1147, 0000,003C,0180,0800,0000,11E2   ;3231           NOP
```

```
                                         ;3232          .PAGE   "TEST A5        DATA PATH TO AND FROM DATA MEMORY TEST"
                                         ;3233   ;*******************************************************************
                                         ;3234   ;++
                                         ;3235   ; TEST  A5      DATA PATH TO AND FROM DATA MEMORY TEST
                                         ;3236   ;
                                         ;3237   ; TEST DESCRIPTION
                                         ;3238   ;      THIS IS A TEST OF THE TB DATA MEMORY AT ONE LOCATION
                                         ;3239   ;      IN EACH GROUP. THIS TEST FLOATS A ONE ACROSS A FIELD
                                         ;3240   ;      OF 0'S AND A ZERO ACROSS A FIELD OF ONES. LOCATION ZERO
                                         ;3241   ;      IS USED IN EACH GROUP.
                                         ;3242   ;
                                         ;3243   ; ERROR DESCRIPTION
                                         ;3244   ;      EXPECTED TBER0 (IF CHECKING HIT/MISS BITS)
                                         ;3245   ;              OR GOT TBER1 (IF UNEXPECTED UTRAP OCCURRED)
                                         ;3246   ;      ACTUAL TBER0
                                         ;3247   ;      EXPECTED TIME OUT ADDRESS REGISTER
                                         ;3248   ;      ACTUAL TIME OUT ADDRESS REGISTER
                                         ;3249   ;      VA WRITTEN
                                         ;3250   ;      UTRAP FLAG (IF UNEXPECTED UTRAP OCCURS)
                                         ;3251   ;              FLAG            UTRAP TYPE
                                         ;3252   ;              ----            ----------
                                         ;3253   ;              DE              NO UTRAP OCCURRED
                                         ;3254   ;              5E              TB PARITY ERROR
                                         ;3255   ;              9E              TB MISS
                                         ;3256   ;              CE              TB PROTECTION ERROR
                                         ;3257   ;              D6              TB MODIFY BIT ERROR
                                         ;3258   ;              DA              X PAGE UTRAP
                                         ;3259   ;              DC              UNALIGNED DATA UTRAP
                                         ;3260   ;
                                         ;3261   ;--
                                         ;3262   ;*******************************************************************
                                         ;3263   =0
U 11E2, 0000,003D,0180,0800,0000,1076    ;3264   TBFLT:  NEWTST
U 11E3, 0018,0038,D580,09F8,0000,11E4    ;3265           RC[0F]_K[.6]
U 11E4, 0000,003D,0180,0800,0000,1222    ;3266   =0      CALL,J7CSOFF            ; TURN OFF CACHE AND SBI
U 11E5, 0000,003C,0180,0800,0000,11E6    ;3267           NOP
U 11E6, 0F00,003D,0180,0800,0000,1014    ;3268   =0      D_0,CALL,J/DC.DE
U 11E7, 0001,003C,0180,0AF0,0000,11E8    ;3269           R[0E]_D                 ; SET UP UTRAP FLAG, R[0E]=DE
U 11E8, 0000,003D,0180,0800,0000,1275    ;3270   =0      CALL,J/TBWPTP           ; GENERATE SOME TEST PATTERNS
U 11E9, 0018,0038,2180,0AA0,0000,11EA    ;3271           R[4]_K[.14]             ; INITIAL A COUNTER
                                         ;3272   =0
U 11EA, 0000,003D,0180,0800,0000,1218    ;3273   TBFLT0: ERLOOP
U 11EB, 0000,003C,8580,0800,0084,73A3    ;3274           SC_K[.C]
U 13A3, 0803,001C,0180,0800,0000,13A4    ;3275           ALU_NOT.MASK,D_ALU      : D=1000
U 13A4, 0000,003C,6580,3C00,0000,13A5    ;3276           ID[SBI.ERR]_D           ; UNLOCK THE TIME OUT ADDRESS REGISTER
U 13A5, 0010,0038,0180,0908,0200,13A6    ;3277           VA_RC[1]                ; RC[1]=4CCCC000=VA
U 13A6, 0000,003C,0180,0900,0000,11EC    ;3278           LC_RC[0]                ; RC[0]=A4155555, A PTE
U 11EC, 0010,0039,0180,0AC0,0000,1044    ;3279   =0      R[8]_LC,CALL,J/TBWRB    ; WRITE THIS VA AND PTE INTO BOTH GROUPS
U 11ED, 0000,003C,0180,0A20,0082,13A7    ;3280           SC_R[4]                 ; GENERATE THE TEST PATTERN
U 13A7, 0000,003C,01C0,0A60,0000,13A8    ;3281           Q_R[0C]                 ; TO BE USED AS A PTE
U 13A8, 0001,201C,01C0,0800,0000,13A9    ;3282           ALU_Q.ORNOT.MASK,Q_ALU
U 13A9, 0010,0038,0180,0938,0200,13AA    ;3283           VA_RC[7]
U 13AA, 0010,0038,0180,09D0,0000,13AB    ;3284           RC[0A]_LC
U 13AB, 0010,0038,0180,0AA8,0000,11EE    ;3285           R[5]_LC
U 11EE, 0001,203D,0180,0AB0,0000,1048    ;3286   =0      R[6]_Q,CALL,J/RELSUB    ; GO GENERATE THE EXPECTED RESULT
```

```
U 11EF, 0000,003C,01C0,0A30,0000,13AC   ;3287           Q_R[6]                  ; AS IT WOULD APPEAR IN A RELOCATED ADDRESS
U 13AC, 0001,203C,0180,0AC0,0000,11F0   ;3288           R[8]_Q
U 11F0, 0000,003D,0180,0800,0000,103C   ;3289   =0      CALL,J/TBWRO            ; WRITE THIS PTE, WITH VA=33330000,
                                        ;3290                                   ; INTO GROUP 0
U 11F1, 0000,003C,0180,0800,0000,1148   ;3291           NOP
U 1148, 0000,003D,0180,0800,0000,124C   ;3292   =000    CALL,J/HITO             ; NOW READ VA=33330000, CHECK FOR GROUP 0 HIT
U 1149, 0000,003D,0180,0800,0000,1219   ;3293           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 114A, 0000,003D,0180,0800,0000,1219   ;3294           ERROR1          ; A TB MISS TRAP OCCURRED.
U 114B, 0000,003D,0180,0800,0000,1219   ;3295           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 114C, 0000,003D,0180,0800,0000,1232   ;3296           CALL,J/RELCHK           ; CHECK RELOCATED ADDRESS
U 114D, 0000,003D,0180,0800,0000,1219   ;3297           ERROR1          ; A UTRAP OCCURRED.
U 114E, 0000,003D,0180,0800,0000,1219   ;3298           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 114F, 0000,003C,0180,0800,0000,13AD   ;3299           NOP
U 13AD, 0000,003C,0180,0A20,0082,13AE   ;3300           SC_R[4]                 ; NOW TRY THE COMPLIMENT TEST PATTERN
U 13AE, 0000,003C,01C0,0A68,0000,13AF   ;3301           Q_R[0D]
U 13AF, 0001,2034,01C0,0A60,0000,11F2   ;3302           ALU_Q.AND.MASK,Q_ALU,LAB_R[0C]
U 11F2, 001C,0031,01C0,0AB0,0000,1048   ;3303   =0      ALU_LA[OR]Q,Q_ALU,R[6]_ALU,CALL,J/RELSUB
U 11F3, 0000,003C,01C0,0A30,0000,13B0   ;3304           Q_R[6]
U 13B0, 0001,203C,0180,0AC0,0000,11F4   ;3305           R[8]_Q
U 11F4, 0000,003D,0180,0800,0000,103C   ;3306   =0      CALL,J/TBWRO            ; WRITE THIS TEST PATTERN INTO GROUP 0
                                        ;3307                                   ; WITH VA=33330000
U 11F5, 0000,003C,0180,0800,0000,1158   ;3308           NOP
U 1158, 0000,003D,0180,0800,0000,124C   ;3309   =000    CALL,J/HITO             ; READ VA=33330000, SHOULD HIT IN GROUP 0
U 1159, 0000,003D,0180,0800,0000,1219   ;3310           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 115A, 0000,003D,0180,0800,0000,1219   ;3311           ERROR1          ; A TB MISS TRAP OCCURRED.
U 115B, 0000,003D,0180,0800,0000,1219   ;3312           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 115C, 0000,003D,0180,0800,0000,1232   ;3313           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 115D, 0000,003D,0180,0800,0000,1219   ;3314           ERROR1          ; A UTRAP OCCURRED.
U 115E, 0000,003D,0180,0800,0000,1219   ;3315           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 115F, 0000,003C,0180,0800,0000,13B1   ;3316           NOP
                                        ;3317   ; NOW GO BACK TO SEE IF GROUP 1 IS INTACT.
U 13B1, 0010,0038,0180,0908,0200,13B2   ;3318           VA_RC[1]                ; RC[1]=4CCCC000
U 13B2, 0010,0038,0180,09D0,0000,13B3   ;3319           RC[0A]_LC
U 13B3, 0000,003C,0180,0910,0000,1160   ;3320           LC_RC[2]                ; RC[2]=0AAAAA80, EXPECTED RELOCATED ADDRESS
U 1160, 0010,0039,0180,0AB8,0000,1258   ;3321   =000    R[7]_LC,CALL,J/HIT1     ; CHECK FOR HIT IN GROUP 1
U 1161, 0000,003D,0180,0800,0000,1219   ;3322           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1162, 0000,003D,0180,0800,0000,1219   ;3323           ERROR1          ; A TB MISS TRAP OCCURRED.
U 1163, 0000,003D,0180,0800,0000,1219   ;3324           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1164, 0000,003D,0180,0800,0000,1232   ;3325           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 1165, 0000,003D,0180,0800,0000,1219   ;3326           ERROR1          ; A UTRAP OCCURRED.
U 1166, 0000,003D,0180,0800,0000,1219   ;3327           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1167, 0000,003C,0180,0800,0000,11F6   ;3328           NOP
                                        ;3329   ; NOW TEST GROUP 1
U 11F6, 0000,003D,0180,0800,0000,1218   ;3330   =0      ERLOOP
U 11F7, 0000,003C,8580,0800,0084,73B4   ;3331   TBFLT1: SC_K[.C]
U 13B4, 0803,001C,0180,0800,0000,13B5   ;3332           ALU_NOT.MASK,D_ALU      ; D=1000
U 13B5, 0000,003C,6580,3C00,0000,13B6   ;3333           ID[SBI.ERR]_D           ; UNLOCK THE TIME OUT ADDRESS REGISTER
U 13B6, 0010,0038,0180,0920,0200,13B7   ;3334           VA_RC[4]                ; VA=RC[4]=55554000
U 13B7, 0000,003C,0180,0918,0000,11F8   ;3335           LC_RC[3]                ; RC[3]=PTE=A4199999
U 11F8, 0010,0039,0180,0AC0,0000,1044   ;3336   =0      R[8]_LC,CALL,J/TBWRB    ; WRITE THE VA AND PTE INTO BOTH GROUPS
U 11F9, 0000,003C,0180,0A20,0082,13B8   ;3337           SC_R[4]                 ; GENERATE THE TEST PATTERN
U 13B8, 0000,003C,01C0,0A60,0000,13B9   ;3338           Q_R[0C]
U 13B9, 0001,201C,01C0,0800,0000,13BA   ;3339           ALU_Q.ORNOT.MASK,Q_ALU
U 13BA, 0000,003C,0180,0A08,0200,13BB   ;3340           VA_R[1]                 ; R[1]=VA=2AAA8000
U 13BB, 0000,003C,0180,09D0,0000,13BC   ;3341           RC[0A]_LA
```

```
U 13BC, 0000,003C,0180,0AA8,0000,11FA   ;3342           R[5]_LA
U 11FA, 0001,203D,0180,0AB0,0000,1048   ;3343   =0      R[6]_Q,CALL,J/RELSUB    ; GENERATE THE EXPECTED RELOCATED ADDRESS
U 11FB, 0000,003C,01C0,0A30,0000,13BD   ;3344           Q_R[6]
U 13BD, 0001,203C,0180,0AC0,0000,1200   ;3345           R[8]_Q
U 1200, 0000,003D,0180,0800,0000,1024   ;3346   =0      CALL,J/TBWR1            ; WRITE THIS TEST PATTERN INTO GROUP 1
U 1201, 0000,003C,0180,0800,0000,1168   ;3347           NOP
U 1168, 0000,003D,0180,0800,0000,1258   ;3348   =000    CALL,J/HIT1             ; READ VA=2AAA8000, SHOULD HIT IN GROUP 1
U 1169, 0000,003D,0180,0800,0000,1219   ;3349           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 116A, 0000,003D,0180,0800,0000,1219   ;3350           ERROR1          ; A TB MISS TRAP OCCURRED.
U 116B, 0000,003D,0180,0800,0000,1219   ;3351           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 116C, 0000,003D,0180,0800,0000,1232   ;3352   =0      CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 116D, 0000,003D,0180,0800,0000,1219   ;3353           ERROR1          ; A UTRAP OCCURRED.
U 116E, 0000,003D,0180,0800,0000,1219   ;3354           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 116F, 0000,003C,0180,0800,0000,13BE   ;3355           NOP
U 13BE, 0000,003C,0180,0A20,0082,13BF   ;3356           SC_R[4]                 ; GENERATE THE COMPLIMENT TEST PATTERN
U 13BF, 0000,003C,01C0,0A68,0000,13C0   ;3357           Q_R[0D]
U 13C0, 0001,2034,01C0,0A60,0000,1202   ;3358           ALU_Q.AND.MASK,Q_ALU,LAB_R[0C]
U 1202, 001C,0031,01C0,0AB0,0000,1048   ;3359   =0      ALU_LA[OR]Q,Q_ALU,R[6]_ALU,CALL,J/RELSUB
U 1203, 0000,003C,01C0,0A30,0000,13C1   ;3360           Q_R[6]
U 13C1, 0001,203C,0180,0AC0,0000,1204   ;3361           R[8]_Q
U 1204, 0000,003D,0180,0800,0000,1024   ;3362   =0      CALL,J/TBWR1            ; VA=2AAA80000
                                        ;3363                                   ; WRITE COMPLIMENT PATTERN INTO GROUP 1
U 1205, 0000,003C,0180,0800,0000,1170   ;3364           NOP
U 1170, 0000,003D,0180,0800,0000,1258   ;3365   =000    CALL,J/HIT1             ; READ HIT IN GROUP 1
U 1171, 0000,003D,0180,0800,0000,1219   ;3366           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1172, 0000,003D,0180,0800,0000,1219   ;3367           ERROR1          ; A TB MISS TRAP OCCURRED.
U 1173, 0000,003D,0180,0800,0000,1219   ;3368           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1174, 0000,003D,0180,0800,0000,1232   ;3369           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 1175, 0000,003D,0180,0800,0000,1219   ;3370           ERROR1          ; A UTRAP OCCURRED.
U 1176, 0000,003D,0180,0800,0000,1219   ;3371           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1177, 0000,003C,0180,0800,0000,13C2   ;3372           NOP
                                        ;3373   ; NOW GO BACK TO SEE IF GROUP 0 IS INTACT.
U 13C2, 0010,0038,0180,0920,0200,13C3   ;3374           VA_RC[4]                ; VA=RC[4]=55554000
U 13C3, 0010,0038,0180,09D0,0000,13C4   ;3375           RC[0A]_LC
U 13C4, 0000,003C,0180,0928,0000,1180   ;3376           LC_RC[5]                ; RC[5]=0CCCCC80
U 1180, 0010,0039,0180,0AB8,0000,124C   ;3377   =000    R[7]_LC,CALL,J/HIT0     ; VA=55554000 SHOULD HIT IN GROUP 0
U 1181, 0000,003D,0180,0800,0000,1219   ;3378           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1182, 0000,003D,0180,0800,0000,1219   ;3379           ERROR1          ; A TB MISS TRAP OCCURRED.
U 1183, 0000,003D,0180,0800,0000,1219   ;3380           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1184, 0000,003D,0180,0800,0000,1232   ;3381           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 1185, 0000,003D,0180,0800,0000,1219   ;3382           ERROR1          ; A UTRAP OCCURRED.
U 1186, 0000,003D,0180,0800,0000,1219   ;3383           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1187, 0000,003C,0180,0800,0000,13C5   ;3384           NOP
U 13C5, 0000,003C,0180,0A20,0010,13C6   ;3385           ALU_R[4],CLK.UBCC       : SEE IF ALL TEST PATTERNS HAVE BEEN TRIED.
U 13C6, 0000,013C,0180,0800,0000,1206   ;3386           Z?
U 1206, 0018,0000,0580,0AA0,0000,11EA   ;3387   =0      R[4]_LA-K[.1],J/TBFLT0  ; IF NOT CONTINUE
U 1207, 0000,003C,0180,0800,0000,1208   ;3388           NOP
                                        ;3389   =0
U 1208, 0000,003D,0180,0800,0000,1076   ;3390   DUMMY1: NEWTST
```

```
;                            Location / Line Number Index

;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000           1871:    1838     1845=    1861=    1862=    1863=    1839     2292=
U 1008           2717=    2718=    2719=    2720=    1951=    1952=    1840     2293=
U 1010           2783=    2784=    2785=    2786=    1970=    1971=    1841     2294=
U 1018           2844=    2845=    2846=    2847=    1972=    1973=    1842     2295=
U 1020           2854=    2855=    2856=    2857=    1982=    1983=    1843     2327=
U 1028           2954=    2955=    2956=    2957=    1984=    1985=    1844     2328=
U 1030           2962=    2963=    2964=    2965=    1986=    1987=    1864     2329=
U 1038           3168=    3169=    3170=    3171=    1992=    1993=    1865     2330=
U 1040           3207=    3208=    3209=    3210=    1996=    1997=    1866     2400=
U 1048           2006=    2007=    2008=    2009=    2019=    2020=    1902:    2401=
U 1050           2026=    2027=    2028=    2029=    2038=    2039=    1867     2402=
U 1058           2047=    2048=    1905:    1868     2055=    2056=    1908:    2403=
U 1060           2060=    2061=    2070=    2071=    2079=    2080=    1869     2439=
U 1068           2082=    2083=    2087=    2088=    2115=    2116=    1870     2440=
U 1070           2118=    2119=    2121=    2122=    2125=    2126=    1880     2441=
U 1078           2128=    2129=    2131=    2132=    2135=    2136=    1881     2442=
U 1080           2659=    2660=    2661=    2662=    2663=    2664=    2665=    2666=
U 1088           2684=    2685=    2686=    2687=    2688=    2689=    2690=    2691=
U 1090           2737=    2738=    2739=    2740=    2741=    2742=    2743=    2744=
U 1098           2139=    2140=    2179=    2180=    2668=    2669=    2670=    2671=
U 10A0           2755=    2756=    2757=    2758=    2759=    2760=    2761=    2762=
U 10A8           2802=    2803=    2804=    2805=    2806=    2807=    2808=    2809=
U 10B0           2820=    2821=    2822=    2823=    2824=    2825=    2826=    2827=
U 10B8           2184=    2185=    2187=    2188=    2693=    2694=    2695=    2696=
U 10C0           2868=    2869=    2870=    2871=    2872=    2873=    2874=    2875=
U 10C8           2900=    2901=    2902=    2903=    2904=    2905=    2906=    2907=
U 10D0           2918=    2919=    2920=    2921=    2922=    2923=    2924=    2925=
U 10D8           2189=    2190=    2194=    2195=    2722=    2723=    2724=    2725=
U 10E0           2990=    2991=    2992=    2993=    2994=    2995=    2996=    2997=
U 10E8           3005=    3006=    3007=    3008=    3009=    3010=    3011=    3012=
U 10F0           3024=    3025=    3026=    3027=    3028=    3029=    3030=    3031=
U 10F8           2197=    2198=    2199=    2200=    2788=    2789=    2790=    2791=
U 1100           1825:    1826:    1827:    1828:    1829:    1830:    1831:    1832:
U 1108           1833:    1882     2204=    2205=    1834:    1835:    1836:    1837:
U 1110           3040=    3041=    3042=    3043=    3044=    3045=    3046=    3047=
U 1118           3085=    3086=    3087=    3088=    3089=    3090=    3091=    3092=
U 1120           3103=    3104=    3105=    3106=    3107=    3108=    3109=    3110=
U 1128           3131=    3132=    3133=    3134=    3135=    3136=    3137=    3138=
U 1130           3148=    3149=    3150=    3151=    3152=    3153=    3154=    3155=
U 1138           3186=    3187=    3188=    3189=    3190=    3191=    3192=    3193=
U 1140           3224=    3225=    3226=    3227=    3228=    3229=    3230=    3231=
U 1148           3292=    3293=    3294=    3295=    3296=    3297=    3298=    3299=
U 1150           2207=    2208=    2209=    2210=    1883     1928:    2214=    2215=
U 1158           3309=    3310=    3311=    3312=    3313=    3314=    3315=    3316=
U 1160           3321=    3322=    3323=    3324=    3325=    3326=    3327=    3328=
U 1168           3348=    3349=    3350=    3351=    3352=    3353=    3354=    3355=
U 1170           3365=    3366=    3367=    3368=    3369=    3370=    3371=    3372=
U 1178           2217=    2218=    2255=    2256=    2223:    2224:    2225:    2226:
U 1180           3377=    3378=    3379=    3380=    3381=    3382=    3383=    3384=
U 1188           2261=    2262=    2263=    2264=    2284=    2286=    2297=    2299=
U 1190           2319=    2321=    2332=    2334=    2336=    2337=    2355=    2356=
U 1198           2362=    2363=    2364=    2365=    2390=    2392=    2429=    2431=
;Location         0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0            2446=   2447=   2464=   2465=   2473=   2474=   2489=   2490=
U 11A8            2595=   2596=   2597=   2598=   2599=   2600=   2601=   2602=
U 11B0            2603=   2604=   2608=   2614=   2616=   2623=   2626=   2627=
U 11B8            2631=   2638=   2641=   2642=   2646=   2647=   2648=   2656=
U 11C0            2706=   2707=   2711=   2712=   2772=   2773=   2777=   2778=
U 11C8            2836=   2837=   2884=   2885=   2889=   2897=   2934=   2942=
U 11D0            2944=   2945=   2977=   2978=   3053=   3054=   3056=   3062=
U 11D8            3064=   3072=   3074=   3082=   3120=   3121=   3159=   3160=
U 11E0            3197=   3198=   3264=   3265=   3266=   3267=   3268=   3269=
U 11E8            3270=   3271=   3273=   3274=   3279=   3280=   3286=   3287=
U 11F0            3289=   3291=   3303=   3304=   3306=   3308=   3330=   3331=
U 11F8            3336=   3337=   3343=   3344=   2227:   2228:   2229:   2230:
U 1200            3346=   3347=   3359=   3360=   3362=   3364=   3387=   3388=
U 1208            3390=   1884    1885    1886    1887    1888    1889    1890
U 1210            1891    1892    1893    1894    1895    1896    1897    1898
U 1218            1899    1900    1901    1903    1904    1936    1937    1943
U 1220            1944    1945    1950    1953    1954    1957    1958    1959
U 1228            1960    1963    1964    1965    1988    1989    1999    2010
U 1230            2011    2012    2018    2021    2022    2023    2024    2025
U 1238            2030    2031    2032    2033    2034    2035    2036    2037
U 1240            2040    2041    2046    2049    2050    2051    2052    2053
U 1248            2054    2057    2058    2059    2068    2072    2073    2074
U 1250            2075    2076    2077    2078    2081    2084    2085    2086
U 1258            2090    2092    2093    2094    2095    2096    2097    2098
U 1260            2099    2100    2101    2102    2103    2104    2105    2106
U 1268            2107    2108    2109    2110    2111    2112    2113    2117
U 1270            2123    2127    2133    2137    2141    2167    2168    2169
U 1278            2170    2171    2172    2173    2174    2175    2176    2177
U 1280            2178    2181    2182    2183    2186    2191    2192    2193
U 1288            2196    2201    2202    2203    2206    2211    2212    2213
U 1290            2216    2222    2257    2258    2259    2260    2265    2266
U 1298            2267    2268    2269    2270    2271    2272    2273    2274
U 12A0            2275    2276    2277    2278    2279    2280    2281    2282
U 12A8            2283    2287    1929:   2288    2289    2290    2291    2296
U 12B0            2301    2302    2303    2304    2305    2306    2307    2308
U 12B8            2309    2310    2311    2312    2313    2314    2315    2316
U 12C0            2317    2318    2322    2323    2324    2325    2326    2331
U 12C8            2335    2357    2358    2359    2360    2361    2366    2367
U 12D0            2368    2369    2370    2371    2372    2373    2374    2375
U 12D8            2376    2377    2378    2379    2380    2381    2382    2383
U 12E0            2384    2385    2386    2387    2388    2389    2393    2394
U 12E8            2395    2396    2397    2398    2399    2404    2406    2407
U 12F0            2408    2409    2410    2411    2412    2413    2414    2415
U 12F8            2416    2417    2418    2419    2420    2421    2422    2423
U 1300            2424    2425    2426    2427    2428    2432    2433    2434
U 1308            2435    2436    2437    2438    2443    2444    2445    2466
U 1310            2467    2468    2469    2470    2471    2472    2475    2476
U 1318            2477    2478    2479    2480    2481    2482    2483    2484
U 1320            2485    2486    2487    2488    2605    2606    2607    2615
U 1328            2624    2625    2628    2629    2630    2639    2640    2643
U 1330            2644    2645    2657    2658    2667    2672    2681    2682
U 1338            2683    2692    2697    2703    2704    2705    2708    2709
U 1340            2710    2716    2721    2734    2735    2736    2752    2753
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348          2754    2769    2770    2771    2774    2775    2776    2782
U 1350          2787    2799    2800    2801    2817    2818    2819    2833
U 1358          2834    2835    2843    2853    2865    2866    2867    2881
U 1360          2882    2883    2886    2887    2888    2898    2899    2915
U 1368          2916    2917    2931    2932    2933    2943    2953    2961
U 1370          2973    2974    2975    2976    2987    2988    2989    3002
U 1378          3003    3004    3021    3022    3023    3037    3038    3039
U 1380          3055    3063    3073    3083    3084    3100    3101    3102
U 1388          3118    3119    3128    3129    3130    3145    3146    3147
U 1390          3161    3162    3163    3167    3175    3176    3183    3184
U 1398          3185    3199    3200    3201    3202    3206    3214    3215
U 13A0          3221    3222    3223    3275    3276    3277    3278    3281
U 13A8          3282    3283    3284    3285    3288    3300    3301    3302
U 13B0          3305    3318    3319    3320    3332    3333    3334    3335
U 13B8          3338    3339    3340    3341    3342    3345    3356    3357
U 13C0          3358    3361    3374    3375    3376    3385    3386
U 13C8 - 13EF Unused
U 13F0          1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8          1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH27        983

Used             983
Remaining

Total microwords used in memory U: 983
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH27.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

; 3 Control ROM Field Definitions
; 548 Register Transfer Macro Definitions
; 1413 Non-transfer Functions
; 1485 Branch Enable Macro Definitions
; 1564 MICRO DIAGNOSTIC DEFINED MACROS
; 1806 MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2227 TEST A6 ADDRESS PATH TO AND FROM TAG MEMORY TEST
; 2378 TEST A7 GROUP 0 COMPARATORS TEST
; 2560 TEST A8 GROUP 1 COMPARATORS TEST
; 2735 TEST A9 TB PARITY LOGIC TEST
; 2979 TEST AA MODIFY BIT UTRAP TEST
; 3127 TEST AB TB VALID BIT UTRAP TEST

```
                                        ;1      .NOLIST
                                        ;1804   .LIST
                                        ;1805
```

```
                                               .TOC     "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                        .REGION/1000,13FF
                                        ;+
                                        ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                        ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                        ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                        ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                        ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                        ;
                                        ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                        ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                        ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                        ;       R[OF] AND DO A RETURNO.
                                        ;
                                        ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                        ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                        ; TO THE CONSOLE.
                                        ;
                                        ;-
U 1100, 0000,003C,1980,0800,0084,7003   1100:   SC_K[ZERO],J/TRPH1      ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001   1101:   SC_K[.1],J/TRPHO        ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001   1102:   SC_K[.2],J/TRPHO        ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001   1103:   SC_K[.3],J/TRPHO        ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001   1104:   SC_K[.4],J/TRPHO        ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001   1105:   SC_K[.6],J/TRPHO        ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001   1106:   SC_K[.9],J/TRPHO        ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001   1107:   SC_K[.7],J/TRPHO        ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001   1108:   SC_K[.8],J/TRPHO        ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003   110C:   SC_K[.C],J/TRPH1        ; RDS
U 110D, 0000,003C,8980,0800,0084,7003   110D:   SC_K[.D],J/TRPH1        ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001   110E:   SC_K[.10],J/TRPHO       ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003   110F:   SC_K[.F],J/TRPH1        ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,104F   TRPHO:  Q_ID[USTACK]
U 104F, 0C00,003C,01E0,0800,0000,105B           Q_D,D_Q
U 105B, 0000,003C,8180,3C00,0000,105F           ID[USTACK]_D
U 105F, 0C00,003C,01E0,0800,0000,10C5           Q_D,D_Q
U 10C5, 0000,003C,01C0,0A78,0000,1109           Q_R[OF]
U 1109, 0001,2024,0180,0800,0010,1154           ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 1154, 0000,013C,0180,0800,0000,1002           Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000   =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN
                                        ;+
                                        ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                        ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                        ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                        ;
                                        ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                        ;            TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                        ;             FAULT STATUS REGISTER
                                        ;             SBI ERROR REGISTER
                                        ;             TIMEOUT ADDRESS REGISTER
                                        ;             MAINTENANCE REGISTER
                                        ;             CACHE PARITY REGISTER
                                        ;             TB ERROR REGISTER 1
                                        ;             TB ERROR REGISTER 0
                                        ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,104C   ;1861   TRPH1:  RC[0D]_SC
U 104C, 0000,003D,D980,0800,0084,7210   ;1862   =0      SETRCF[.9]
U 104D, 0000,003C,49F0,2C00,0000,11EB   ;1863           Q_ID[TBER0]
U 11EB, 0001,203C,4DF0,2DB0,0000,11EC   ;1864           RC[6]_Q,Q_ID[TBER1]
U 11EC, 0001,203C,65F0,2DB8,0000,11ED   ;1865           RC[7]_Q,Q_ID[SBI.ERR]
U 11ED, 0001,203C,6DF0,2DD8,0000,11EE   ;1866           RC[0B]_Q,Q_ID[FAULT]
U 11EE, 0001,203C,75F0,2DE0,0000,11EF   ;1867           RC[0C]_Q,Q_ID[MAINT]
U 11EF, 0001,203C,79F0,2DC8,0000,11F0   ;1868           RC[9]_Q,Q_ID[PARITY]
U 11F0, 0001,203C,69F0,2DC0,0000,11F1   ;1869           RC[8]_Q,Q_ID[TIME.ADDR]
U 11F1, 0001,203C,81F0,2DD0,0000,1000   ;1870           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,120A   ;1871   1000:   RC[0E]_Q,ERROR1
                                        ;1872   ;+
                                        ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1875   ;                NEWTST
                                        ;1876   ;                ERLOOP
                                        ;1877   ;                ERROR1
                                        ;1878   ;                ERROR2
                                        ;1879   ;
U 11F2, 0000,003C,65F8,0800,0084,71F3   ;1880   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 11F3, 0818,0038,8D80,0800,0000,11F4   ;1881           D_K[.1F]                        ; ...
U 11F4, 0D00,003C,0180,0800,0000,11F5   ;1882           D_DAL.SC
U 11F5, 0000,003C,3D80,3C00,0000,11F6   ;1883           ID[PSL]_D                       ; WRITE THE PSL
U 11F6, 0818,0038,0580,0800,0000,11F7   ;1884           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 11F7, 0D00,003C,0180,0800,0000,11F8   ;1885           D_DAL.SC
U 11F8, 0F00,003C,3180,3C00,0000,11F9   ;1886           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 11F9, 0000,003C,5D80,3C00,0000,11FA   ;1887           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 11FA, 0000,003C,3980,3C00,0000,11FB   ;1888           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 11FB, 0000,003C,2980,3C00,0000,1200   ;1889           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 1200, 0000,003C,4980,3C00,0000,1201   ;1890           ID[TBER0]_D                     ; SHUT OFF THE TB
U 1201, 0818,0038,C180,0800,0000,1202   ;1891           D_K[.FFFF]
U 1202, 0000,003C,6580,3C00,0000,1203   ;1892           ID[SBI.ERR]_D
U 1203, 0F00,003C,6D80,3C00,0000,1204   ;1893           ID[FAULT]_D,D_0
U 1204, 0000,003C,6D80,3C00,0000,1205   ;1894           ID[FAULT]_D
U 1205, 0000,003C,6580,3C00,0000,1206   ;1895           ID[SBI.ERR]_D
U 1206, 0003,003C,0180,09F0,0000,1207   ;1896           RC[0E]_0
U 1207, 0003,003C,0180,0AF8,0000,1208   ;1897           R[0F]_0
U 1208, 0003,003C,0180,09E8,0000,105E   ;1898           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 1209, 0818,0038,0980,0800,0000,105E   ;1899   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 120A, 0810,0038,0180,0978,0000,120B   ;1900   ERROR1: D_RC[0F]
U 120B, 0819,0034,4D80,0800,0000,104E   ;1901           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1902   104E:   D_D.OR.K[.4],J/CALLCON
U 120C, 0810,0038,0180,0978,0000,120D   ;1903   ERROR2: D_RC[0F]
U 120D, 0819,0034,4D80,0800,0000,105A   ;1904           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1905   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1906   105E:
                                        ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1908           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1909   ;+
                                        ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1912   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1913   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1914   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1915   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,120E   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 120E, 0810,0038,4D80,0978,0000,120F   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 120F, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 1210, 0010,0038,01C0,0978,0000,1211   ;1943   SETRCF: Q_RC[OF]
U 1211, 0019,2034,4DC0,0800,0000,1212   ;1944           Q_Q.AND.K[.FF00]
U 1212, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946   ; THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
                                        ;1947   ; AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
                                        ;1948   ; UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
                                        ;1949   ; ARE LOST.
U 1213, 0F18,0038,C1F8,0800,0000,1058   ;1950   CSOFF:  D_0,Q_0,ALU_K[.FFFF]
U 1058, 0500,003D,0380,0800,0000,125A   ;1951   =0      D_D.LEFT,SI77,CALL,J/DC9
U 1059, 0000,003C,8580,0800,0084,7214   ;1952           SC_K[.C]
U 1214, 0D00,003C,0180,0800,0000,1215   ;1953           D_DAL.SC
U 1215, 0000,003E,7580,3C00,0000,0001   ;1954           ID[MAINT]_D,RETURN1
                                        ;1955   ; THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
                                        ;1956   ; BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.
U 1216, 0818,0038,0DF8,0800,0000,1217   ;1957   COFF:   D_K[.3],Q_0
U 1217, 0000,003C,6180,0800,0084,7218   ;1958           SC_K[.F]
U 1218, 0D00,003C,0180,0800,0000,1219   ;1959           D_DAL.SC
U 1219, 0000,003E,7580,3C00,0000,0001   ;1960           ID[MAINT]_D,RETURN1
                                        ;1961   ; THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
                                        ;1962   ; APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.
U 121A, 0000,003C,8580,0800,0084,721B   ;1963   SOFF:   SC_K[.C]
U 121B, 0803,001C,0180,0800,0000,121C   ;1964           ALU_NOT.MASK,D_ALU
U 121C, 0000,003E,7580,3C00,0000,0001   ;1965           ID[MAINT]_D,RETURN1
                                        ;1966   ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                        ;1967   ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                        ;1968   ; CERTAIN TRAPS.
                                        ;1969   =0
U 105C, 0000,003D,0180,0800,0000,125E   ;1970   DC.DE:  CALL,J/DCD
```

```
U 105D, 0000,003C,0180,0800,0000,10C6   ;1971           NOP
U 10C6, 0000,003D,0180,0800,0000,125F   ;1972   =0      CALL,J/DCE
U 10C7, 0000,003E,0180,0800,0000,0001   ;1973           RETURN1
                                        ;1974   ; THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
                                        ;1975   ; IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
                                        ;1976   ; VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
                                        ;1977   ; MME WILL BE SET HERE. UPON RETURN THE CONTENTS
                                        ;1978   ; OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
                                        ;1979   ; D AND Q ARE LOST.
                                        ;1980   ; THIS ROUTINE WRITES GROUP 1
                                        ;1981   =0
U 10E8, 0F00,003D,0180,0800,0000,1259   ;1982   TBWR1:  D_0,CALL,J/DC8
U 10E9, 0100,003C,0180,0800,0000,10EA   ;1983   TBWR:   D_D.LEFT2,SI/ZERO
U 10EA, 0100,003D,0180,0800,0000,1251   ;1984   =0      D_D.LEFT2,SI/ZERO,CALL,J/DC0
U 10EB, 0100,003C,0180,0800,0000,10EC   ;1985           D_D.LEFT2,SI/ZERO
U 10EC, 0100,003D,0180,0800,0000,1252   ;1986   =0      D_D.LEFT2,SI/ZERO,CALL,J/DC1
U 10ED, 0800,003C,4980,3E40,0000,121D   ;1987   TBWRA:  ID[TBER0]_D,D_R[8]
U 121D, 0000,003C,4180,3C00,0000,121E   ;1988           ID[TBUF]_D
U 121E, 0000,003E,4DF0,2C00,0000,0001   ;1989           Q_ID[TBER1],RETURN1
                                        ;1990   ; ROUTINE TO WRITE GROUP 0
                                        ;1991   =0
U 10EE, 0F00,003D,0180,0800,0000,1255   ;1992   TBWR0:  D_0,CALL,J/DC4
U 10EF, 0000,003C,0180,0800,0000,10E9   ;1993           J7TBWR
                                        ;1994   ; ROUTINE TO WRITE BOTH GROUP 0 AND 1
                                        ;1995   =0
U 10F0, 0F00,003D,0180,0800,0000,1259   ;1996   TBWRB:  D_0,CALL,J/DC8
U 10F1, 0500,003C,0180,0800,0000,10E9   ;1997           D_D.LEFT,SI/ZERO,J/TBWR
                                        ;1998   ; THIS ROUTINE WRITES THE TB RANDOMLY.
U 121F, 0818,0038,0580,0800,0000,10ED   ;1999   TBWRAN: D_K[.1],J/TBWRA
                                        ;2000   ; THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
                                        ;2001   ; THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
                                        ;2002   ; R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
                                        ;2003   ; TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
                                        ;2004   ; R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
                                        ;2005   =0
U 10F2, 0800,003D,0180,0A30,0000,1251   ;2006   RELSUB: D_R[6],CALL,J/DC0
U 10F3, 0500,003C,D980,0A28,0084,70F4   ;2007           D_D.LEFT,SI/ZERO,SC_K[.9],LAB_R[5]
U 10F4, 0003,0011,01C0,0800,0000,1251   ;2008   =0      ALU_MASK+1,Q_ALU,CALL,J/DC0
U 10F5, 001C,0024,01C0,0800,0000,1220   ;2009           ALU_LA[ANDNOT]Q,Q_ALU
U 1220, 081D,0030,0180,0800,0000,1221   ;2010           ALU_D[OR]Q,D_ALU
U 1221, 0200,003C,0180,0800,0000,1222   ;2011           D_D.RIGHT2,SI/ZERO
U 1222, 0001,003E,0180,0AB8,0000,0001   ;2012           R[7]_D,RETURN1
                                        ;2013   ; THIS SUBROUTINE IS CALLED TO RELOCATE THE VA, GET THE
                                        ;2014   ; TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
                                        ;2015   ; RETURN3 IF THEY ARE EQUAL; RETURN 2 IF THEY ARE NOT EQUAL;
                                        ;2016   ; AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
                                        ;2017   ; INDICATED IN R[E].
U 1223, 0000,003C,0180,0A70,0000,1224   ;2018   RELCHK: LAB_R[0E]
U 1224, 0000,003C,0180,52F8,0000,1225   ;2019           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERNCE
U 1225, 0800,003C,69F0,2E78,0000,1226   ;2020           Q_ID[TIME.ADDR],D_R[0F]
U 1226, 0018,0038,1980,0AF8,0000,1227   ;2021           ALU_0(K),R[0F]_ALU
U 1227, 0000,003C,0180,0A70,0000,1228   ;2022           LAB_R[0E]
U 1228, 001C,2000,0180,0800,0010,1229   ;2023           ALU_LA[A-B]D,CLK.UBCC           ; SEE IF A TRAP OCCURRED.
U 1229, 0000,013C,0180,0800,0000,10F6   ;2024           Z?
U 10F6, 0001,003C,0180,09C8,0000,1232   ;2025   =0      RC[9]_D,J/TBTRUE        ; TRAPPED SO RETURN1.
```

```
U 10F7, 0000,003C,0180,0800,0000,10F8   ;2026           NOP
U 10F8, 0F00,003D,0180,0800,0000,125F   ;2027   =0      D_0,CALL,J/DCE                  ; MASK OFF THE UPPER 4 BITS
U 10F9, 0500,003C,0180,0800,0000,122A   ;2028           D_D.LEFT,SI/ZERO
U 122A, 0001,003C,0180,0800,0082,122B   ;2029           SC_D
U 122B, 0803,0010,0180,0800,0000,122C   ;2030           ALU_MASK+1,D_ALU
U 122C, 001D,2024,01C0,0800,0000,122D   ;2031           ALU_Q[ANDNOT]D,Q_ALU
U 122D, 0800,003C,0180,0A38,0000,122E   ;2032           D_R[7]                          ; SEE IF ADDRESS RELOCATED
U 122E, 0001,003C,0180,09E0,0000,122F   ;2033           RC[OC]_D
U 122F, 0001,203C,0180,09D8,0000,1230   ;2034           RC[OB]_Q
U 1230, 001D,2000,0180,0800,0010,1231   ;2035           ALU_Q-D,CLK.UBCC                ; PROPERLY.
U 1231, 0000,013C,0180,0800,0000,10FA   ;2036           Z?
U 10FA, 0000,003E,0180,0800,0000,0002   ;2037   =0      RETURN2                         ; INCORRECT.
U 10FB, 0000,003E,0180,0800,0000,0003   ;2038           RETURN3                         ; OK
U 1232, 0000,003C,4DF0,2C00,0000,1233   ;2039   TBTRUE: Q_ID[TBER1]
U 1233, 0001,203E,0180,09F0,0000,0001   ;2040           RC[OE]_Q,RETURN1
                                        ;2041   ; THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
                                        ;2042   ; IF NO TRAP OCCURS WHEN THE REFERNCE IS MADE EXECUTE A RETURN1.
                                        ;2043   ; IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
                                        ;2044   ; A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
U 1234, 0000,003C,0180,0A70,0000,1235   ;2045   MISS:   LAB_R[OE]
U 1235, 0000,003C,0180,52F8,0000,1236   ;2046           R[OF]_LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
U 1236, 0800,003C,0180,0A78,0000,1237   ;2047           D_R[OF]
U 1237, 0018,0038,1980,0AF8,0000,1238   ;2048           A[U_0(K),R[OF]_ALU
U 1238, 0000,003C,0180,0A70,0000,1239   ;2049           LAB_R[OE]
U 1239, 0001,003C,0180,09C8,0000,123A   ;2050           RC[9]_D
U 123A, 001C,2000,0180,0800,0010,123B   ;2051           ALU_LA[A-B]D,CLK.UBCC           ; SEE IF A TRAP OCCRRED.
U 123B, 0000,013C,0180,0800,0000,10FC   ;2052           Z?
U 10FC, 0000,003C,0180,0800,0000,123C   ;2053   =0      J/MISSA
U 10FD, 0000,003E,0180,0800,0000,0001   ;2054           RETURN1                         ; NO TRAP SO RETURN1.
U 123C, 0000,003C,D580,0800,0084,723D   ;2055   MISSA:  SC_K[.6]                        ; IF A TRAP OCCURRED SEE
U 123D, 0001,0024,0180,0800,0010,123E   ;2056           ALU_D.ANDNOT.MASK,CLK.UBCC      ; IF IT WAS A TB MISS TRAP.
U 123E, 0000,013C,4DF0,2C00,0000,10FE   ;2057           Z?,Q_ID[TBER1]
U 10FE, 0001,203E,0180,09F0,0000,0002   ;2058   =0      RETURN2,RC[OE]_Q                ; NOT TB MISS.
U 10FF, 0000,003E,0180,0800,0000,0003   ;2059           RETURN3                         ; TB MISS.
                                        ;2060   ; THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
                                        ;2061   ; RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
                                        ;2062   ; TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
                                        ;2063   ; HIT/MISS BIT IN TBERO IS INCORRECT.
                                        ;2064   ; RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
                                        ;2065   ; CHECK HIT IN GROUP 0.
U 123F, 0000,003C,D580,0A70,0084,7240   ;2066   HIT0:   LAB_R[OE],SC_K[.6]
U 1240, 0000,003C,0180,52F8,0000,1241   ;2067   HIT:    R[OF]_LA,FS/MCT,MCT/READ.V.WCHK         ; NO TRAP IF HIT
U 1241, 0800,003C,49F0,2E78,0000,1242   ;2068           Q_ID[TBER0],D_R[OF]
U 1242, 0018,0038,1980,0AF8,0000,1243   ;2069           A[U_0(K),R[OF]_ALU
U 1243, 0001,203C,0180,09E8,0000,1244   ;2070           RC[0D]_Q
U 1244, 0003,001C,0180,09F0,0000,1245   ;2071           RC[OE]_ALU,ALU_NOT.MASK
U 1245, 0000,003C,0180,0A70,0000,1246   ;2072           LAB_R[OE]
U 1246, 001C,2000,0180,0800,0010,1247   ;2073           ALU_LA[A-B]D,CLK.UBCC                   ; SEE IF TRAP OCCURRED.
U 1247, 0001,013C,0180,09C8,0000,110A   ;2074           Z?,RC[9]_D
U 110A, 0000,003C,0180,0800,0000,1249   ;2075   =0      J/HITA                          ; TRAP OCCURRED.
U 110B, 0001,2024,0180,0800,0010,1248   ;2076           ALU_Q.ANDNOT.MASK,CLK.UBCC      ; NO TRAP BUT IS HIT/MISS BIT SET?
U 1248, 0000,013C,0180,0800,0000,1110   ;2077           Z?
U 1110, 0000,003E,0180,0800,0000,0004   ;2078   =0      RETURN4                         ; SET SO IT WAS A HIT.
U 1111, 0000,003E,0180,0800,0000,0003   ;2079           RETURN3                         ; CLEAR SO REFERENCE WAS A MISS.
U 1249, 0000,003C,D580,0800,0084,724A   ;2080   HITA:   SC_K[.6]                        ; TRAPPED, SO SEE IF TB MISS TRAP.
```

```
U 124A, 0001,0024,0180,0800,0010,124B   ;2081           ALU_D.ANDNOT.MASK,CLK.UBCC
U 124B, 0000,013C,0180,0800,0000,1112   ;2082           Z?
U 1112, 0000,003C,0180,0800,0000,1232   ;2083   =0      J/TBTRUE                        ; NOT TB MISS TRAP.
U 1113, 0000,003E,0180,0800,0000,0002   ;2084           RETURN2                         ; TB MISS TRAP OCCURRED.
                                        ;2085   ; CHECK HIT IN GROUP 1.
U 124C, 0000,003C,5D80,0A70,0084,7240   ;2086   HIT1:   LAB_R[0E],SC_K[.7],J/HIT
                                        ;2087   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 124D, 0118,0038,1B80,0800,0000,1261   ;2088   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 124E, 0118,0038,0B80,0800,0000,1261   ;2089   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 124F, 0118,0038,0780,0800,0000,1261   ;2090   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 1250, 0118,0038,C380,0800,0000,1261   ;2091   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 1251, 0018,0038,1980,0800,0000,124D   ;2092   DC0:    ALU_0(K),J/S00
U 1252, 0018,0038,1980,0800,0000,124E   ;2093   DC1:    ALU_0(K),J/S01
U 1253, 0018,0038,1980,0800,0000,124F   ;2094   DC2:    ALU_0(K),J/S10
U 1254, 0018,0038,1980,0800,0000,1250   ;2095   DC3:    ALU_0(K),J/S11
U 1255, 0018,0038,0980,0800,0000,124D   ;2096   DC4:    ALU_K[.2],J/S00
U 1256, 0018,0038,0980,0800,0000,124E   ;2097   DC5:    ALU_K[.2],J/S01
U 1257, 0018,0038,0980,0800,0000,124F   ;2098   DC6:    ALU_K[.2],J/S10
U 1258, 0018,0038,0980,0800,0000,1250   ;2099   DC7:    ALU_K[.2],J/S11
U 1259, 0018,0038,0580,0800,0000,124D   ;2100   DC8:    ALU_K[.1],J/S00
U 125A, 0018,0038,0580,0800,0000,124E   ;2101   DC9:    ALU_K[.1],J/S01
U 125B, 0018,0038,0580,0800,0000,124F   ;2102   DCA:    ALU_K[.1],J/S10
U 125C, 0018,0038,0580,0800,0000,1250   ;2103   DCB:    ALU_K[.1],J/S11
U 125D, 0018,0038,C180,0800,0000,124D   ;2104   DCC:    ALU_K[.FFFF],J/S00
U 125E, 0018,0038,C180,0800,0000,124E   ;2105   DCD:    ALU_K[.FFFF],J/S01
U 125F, 0018,0038,C180,0800,0000,124F   ;2106   DCE:    ALU_K[.FFFF],J/S10
U 1260, 0018,0038,C180,0800,0000,1250   ;2107   DCF:    ALU_K[.FFFF],J/S11
U 1261, 0100,003E,0380,0800,0000,0001   ;2108   SX:     D_D.LEFT2,SI/7,RETURN1
U 1262, 0018,0038,01C0,0800,0000,1114   ;2109   DC.5:   Q_K[.8]
                                        ;2110   =0
U 1114, 0000,003D,0180,0800,0000,1256   ;2111   DC.5A:  CALL,J/DC5
U 1115, 0019,2000,05C0,0800,0010,1263   ;2112           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1263, 0000,013C,0180,0800,0000,1116   ;2113           Z?
U 1116, 0000,003C,0180,0800,0000,1114   ;2114   =0      J/DC.5A
U 1117, 0000,003E,0180,0800,0000,0001   ;2115           RETURN1
                                        ;2116   =0
U 1118, 0000,003D,0180,0800,0000,1262   ;2117   DC.A:   CALL,J/DC.5
U 1119, 0500,003E,0180,0800,0000,0001   ;2118           D_D.LEFT,SI/ZERO,RETURN1
U 1264, 0018,0038,01C0,0800,0000,111A   ;2119   DC.9:   Q_K[.8]
                                        ;2120   =0
U 111A, 0000,003D,0180,0800,0000,125A   ;2121   DC.9A:  CALL,J/DC9
U 111B, 0019,2000,05C0,0800,0010,1265   ;2122           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1265, 0000,013C,0180,0800,0000,111C   ;2123           Z?
U 111C, 0000,003C,0180,0800,0000,111A   ;2124   =0      J/DC.9A
U 111D, 0000,003E,0180,0800,0000,0001   ;2125           RETURN1
                                        ;2126   =0
U 111E, 0000,003D,0180,0800,0000,1264   ;2127   DC.C:   CALL,J/DC.9
U 111F, 0018,0038,C180,0800,0000,1266   ;2128           ALU_K[.FFFF]
U 1266, 0600,003E,0380,0800,0000,0001   ;2129           D_D.RIGHT,SI/7,RETURN1
                                        ;2130   =0
U 1120, 0000,003D,0180,0800,0000,1264   ;2131   DC.6:   CALL,J/DC.9
U 1121, 0018,0038,0580,0800,0000,1267   ;2132           ALU_K[.1]
U 1267, 0100,003E,0380,0800,0000,0001   ;2133           D_D.LEFT2,SI/7,RETURN1
                                        ;2134   =0
U 1122, 0000,003D,0180,0800,0000,1264   ;2135   DC.3:   CALL,J/DC.9
```

```
U 1123, 0018,0038,C180,0800,0000,1268   ;2136          ALU_K[.FFFF]
U 1268, 0500,003E,0380,0800,0000,0001   ;2137          D_D.LEFT,SI/7,RETURN1
                                        ;2138  ; THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
                                        ;2139  ; A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
                                        ;2140  ; SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
                                        ;2141  ; FOLLOWING DATA PATTERNS:
                                        ;2142  ;
                                        ;2143  ;       R[0B]           7FFFC000
                                        ;2144  ;       R[0C]           A4000000
                                        ;2145  ;       R[0D]           001FFFFF
                                        ;2146  ;
                                        ;2147  ;       RC[0]           A4155555
                                        ;2148  ;       RC[1]           4CCCC000
                                        ;2149  ;       RC[2]           0AAAAA80
                                        ;2150  ;
                                        ;2151  ;       RC[3]           A4199999
                                        ;2152  ;       RC[4]           55554000
                                        ;2153  ;       RC[5]           0CCCCC80
                                        ;2154  ;
                                        ;2155  ;       RC[6]           A40AAAAA
                                        ;2156  ;       RC[7]           33330000
                                        ;2157  ;       RC[8]           05555500
                                        ;2158  ;
                                        ;2159  ;       R[0]            A4066666
                                        ;2160  ;       R[1]            2AAA8000
                                        ;2161  ;       R[2]            03333300
                                        ;2162  ;
U 1269, 0F18,0038,0580,0800,0000,126A   ;2163  TBWPTP: D_0,ALU_K[.1]
U 126A, 0218,0038,0B80,0800,0000,126B   ;2164          D_D.RIGHT2,SI/7,ALU_K[.2]
U 126B, 0218,0038,0B80,0800,0000,126C   ;2165          D_D.RIGHT2,SI/7,ALU_K[.2]
U 126C, 0200,003C,0380,0800,0000,126D   ;2166          D_D.RIGHT2,SI/7
U 126D, 0001,003C,0180,0AE0,0000,126E   ;2167          R[0C]_D
U 126E, 0000,003C,6180,0800,0084,726F   ;2168          SC_K[.F]
U 126F, 0043,0010,0180,0AD8,0000,1270   ;2169          ALU_MASK+1,R[0B]_ALU.RIGHT,SI/ZERO
U 1270, 081B,0000,0580,0800,0000,1271   ;2170          D_0_K[.1]
U 1271, 0018,0038,21C0,0800,0000,1272   ;2171          Q_K[.14]
U 1272, 0019,2014,0580,0800,0082,1273   ;2172          ALU_Q+K[.1],SC_ALU
U 1273, 0003,001C,01C0,0800,0000,1274   ;2173          ALU_NOT.MASK,Q_ALU
U 1274, 001D,2014,0180,0AE8,0000,1124   ;2174          ALU_Q[A+B]D,R[0D]_ALU
U 1124, 0000,003D,0180,0800,0000,1262   ;2175  =0      CALL,J/DC.5
U 1125, 0000,003C,0180,0A68,0000,1275   ;2176          LAB_R[0D]
U 1275, 081C,2034,0180,0800,0000,1276   ;2177          ALU_LA[AND]D,D_ALU
U 1276, 081C,2030,0180,0A60,0000,1277   ;2178          LAB_R[0C],ALU_[A[OR]D,D_ALU
U 1277, 0001,003C,0180,0980,0000,1126   ;2179          RC[0]_D
U 1126, 0001,003D,0180,0AB0,0000,111E   ;2180  =0      R[6]_D,CALL,J/DC.C
U 1127, 0000,003C,0180,0A58,0000,1278   ;2181          LAB_R[0B]
U 1278, 081C,2034,0180,0988,0000,1128   ;2182          ALU_LA[AND]D,D_ALU,RC[1]_ALU
U 1128, 0001,003D,0180,0AA8,0000,10F2   ;2183  =0      R[5]_D,CALL,J/RELSUB
U 1129, 0001,003C,0180,0990,0000,112A   ;2184          RC[2]_D
U 112A, 0000,003D,0180,0800,0000,1264   ;2185  =0      CALL,J/DC.9
U 112B, 0000,003C,0180,0A68,0000,1279   ;2186          LAB_R[0D]
U 1279, 081C,2034,0180,0800,0000,127A   ;2187          ALU_LA[AND]D,D_ALU
U 127A, 081C,2030,0180,0A60,0000,127B   ;2188          LAB_R[0C],ALU_[A[OR]D,D_ALU
U 127B, 0001,003C,0180,0998,0000,112C   ;2189          RC[3]_D
U 112C, 0001,003D,0180,0AB0,0000,1262   ;2190  =0      R[6]_D,CALL,J/DC.5
```

```
U 112D, 0000,003C,0180,0A58,0000,127C    ;2191               LAB_R[0B]
U 127C, 081C,2034,0180,09A0,0000,112E    ;2192               ALU_LA[AND]D,D_ALU,RC[4]_ALU
U 112E, 0001,003D,0180,0AA8,0000,10F2    ;2193     =0        R[5]_D,CALL,J/RELSUB
U 112F, 0001,003C,0180,09A8,0000,1130    ;2194               RC[5]_D
U 1130, 0000,003D,0180,0800,0000,1118    ;2195     =0        CALL,J/DC.A
U 1131, 0000,003C,0180,0A68,0000,127D    ;2196               LAB_R[0D]
U 127D, 081C,2034,0180,0800,0000,127E    ;2197               ALU_LA[AND]D,D_ALU
U 127E, 081C,2030,0180,0A60,0000,127F    ;2198               LAB_R[0C],ALU_[A[OR]D,D_ALU
U 127F, 0001,003C,0180,09B0,0000,1132    ;2199               RC[6]_D
U 1132, 0001,003D,0180,0AB0,0000,1122    ;2200     =0        R[6]_D,CALL,J/DC.3
U 1133, 0000,003C,0180,0A58,0000,1280    ;2201               LAB_R[0B]
U 1280, 081C,2034,0180,09B8,0000,1134    ;2202               ALU_LA[AND]D,D_ALU,RC[7]_ALU
U 1134, 0001,003D,0180,0AA8,0000,10F2    ;2203     =0        R[5]_D,CALL,J/RELSUB
U 1135, 0001,003C,0180,09C0,0000,1136    ;2204               RC[8]_D
U 1136, 0000,003D,0180,0800,0000,1120    ;2205     =0        CALL,J/DC.6
U 1137, 0000,003C,0180,0A68,0000,1281    ;2206               LAB_R[0D]
U 1281, 081C,2034,0180,0800,0000,1282    ;2207               ALU_LA[AND]D,D_ALU
U 1282, 081C,2030,0180,0A60,0000,1283    ;2208               LAB_R[0C],ALU_[A[OR]D,D_ALU
U 1283, 0001,003C,0180,0A80,0000,1138    ;2209               R[0]_D
U 1138, 0001,003D,0180,0AB0,0000,1118    ;2210     =0        R[6]_D,CALL,J/DC.A
U 1139, 0000,003C,0180,0A58,0000,1284    ;2211               LAB_R[0B]
U 1284, 081C,2034,0180,0A88,0000,113A    ;2212               ALU_LA[AND]D,D_ALU,R[1]_ALU
U 113A, 0001,003D,0180,0AA8,0000,10F2    ;2213     =0        R[5]_D,CALL,J/RELSUB
U 113B, 0001,003E,0180,0A90,0000,0001    ;2214               R[2]_D,RETURN1
                                         ;2215     ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
                                         ;2216     ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
                                         ;2217     ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 1285, 0000,003F,0180,0800,0000,117C    ;2218     TARGC3:  SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001    ;2219     117C:    RETURN1
U 117D, 0000,003E,0180,0800,0000,0002    ;2220     117D:    RETURN2
U 117E, 0000,003E,0180,0800,0000,0003    ;2221     117E:    RETURN3
U 117F, 0000,003E,0180,0800,0000,0004    ;2222     117F:    RETURN4
U 11FC, 0000,003D,0180,0800,0000,120A    ;2223     11FC:    ERROR1
U 11FD, 0000,003D,0180,0800,0000,120A    ;2224     11FD:    ERROR1
U 11FE, 0000,003D,0180,0800,0000,120A    ;2225     11FE:    ERROR1
U 11FF, 0000,003D,0180,0800,0000,120A    ;2226     11FF:    ERROR1
```

```
                                       ;2227          .PAGE   "TEST A6        ADDRESS PATH TO AND FROM TAG MEMORY TEST"
                                       ;2228   ;*******************************************************************
                                       ;2229   ;++
                                       ;2230   ; TEST  A6      ADDRESS PATH TO AND FROM TAG MEMORY TEST
                                       ;2231   ;
                                       ;2232   ; TEST DESCRIPTION
                                       ;2233   ;       THIS IS A TEST OF THE TB TAG MEMORY IN ONE LOCATION OF
                                       ;2234   ;       EACH GROUP. A 0 IS FLOATED ACROSS A FIELD OF 1'S AND A 1
                                       ;2235   ;       IS FLOATED ACROSS A FIELD OF 0'S IN THE VA. LOCATION
                                       ;2236   ;       0 IS USED IN BOTH GROUPS.
                                       ;2237   ;
                                       ;2238   ; ERROR DESCRIPTION
                                       ;2239   ;       EXPECTED TBERO (IF CHECKING HIT/MISS BITS)
                                       ;2240   ;               OR GOT TBER1 (IF UNEXPECTED UTRAP OCCURRED)
                                       ;2241   ;       ACTUAL TBERO
                                       ;2242   ;       EXPECTED TIME OUT ADDRESS REGISTER
                                       ;2243   ;       ACTUAL TIME OUT ADDRESS REGISTER
                                       ;2244   ;       VA WRITTEN
                                       ;2245   ;       UTRAP FLAG (IF UNEXPECTED UTRAP OCCUFS)
                                       ;2246   ;               FLAG            UTRAP TYPE
                                       ;2247   ;               ----            ----------
                                       ;2248   ;               DE              NO UTRAP OCCURRED
                                       ;2249   ;               5E              TB PARITY ERROR
                                       ;2250   ;               9E              TB MISS
                                       ;2251   ;               CE              TB PROTECTION ERROR
                                       ;2252   ;               D6              TB MODIFY BIT ERROR
                                       ;2253   ;               DA              X PAGE UTRAP
                                       ;2254   ;               DC              UNALIGNED DATA UTRAP
                                       ;2255   ;
                                       ;2256   ;--
                                       ;2257   ;*******************************************************************
                                       ;2258   =0
U 113C, 0000,003D,0180,0800,0000,11F2  ;2259   TBAF:   NEWTST
U 113D, 0018,0038,D580,09F8,0000,113E  ;2260           RC[OF]_K[.6]
U 113E, 0000,003D,0180,0800,0000,1213  ;2261   =0      CALL,J7CSOFF            ; TURN OFF THE CACHE AND SBI CYCLES
U 113F, 0000,003C,0180,0800,0000,1140  ;2262           NOP
U 1140, 0F00,003D,0180,0800,0000,105C  ;2263   =0      D_0,CALL,J/DC.DE
U 1141, 0001,003C,0180,0AF0,0000,1142  ;2264           R[OE]_D                 ; SET UP A UTRAP FLAG, R[OE]=DE
U 1142, 0000,003D,0180,0800,0000,1269  ;2265   =0      CALL,J/TBWPTP           ; GET SOME TEST DATA PATTERNS
U 1143, 0818,0038,6580,0AA0,0000,1286  ;2266           R[4]_K[.10],D_K[.10]    ; INITIALIZE A COUNTER, R[4]=.10
U 1286, 0819,0000,0980,0AC8,0000,1144  ;2267           D_D-K[.2],R[9]_ALU      ; R[9]=.E
                                       ;2268   ;///////7//////////////7/////////////////////////////////////////
                                       ;2269   ; FIRST TEST GROUP 0.
                                       ;2270   =0
U 1144, 0000,003D,0180,0800,0000,1209  ;2271   TBAF0:  ERLOOP
U 1145, 0010,0038,0180,0938,0200,1287  ;2272           VA_RC[7]                ; RC[7]=33330000=VA
U 1287, 0000,003C,0180,0930,0000,1146  ;2273           LC_RC[6]                ; PTE=RC[6]=A40AAAAA
U 1146, 0010,0039,0180,0AC0,0000,10F0  ;2274   =0      R[8]_LC,CALL,J/TBWRB    ; WRITE THIS VA AND PTE INTO BOTH GROUPS
U 1147, 0800,003C,0180,0A20,0000,1288  ;2275           D_R[4]                  ; GENERATE THE DATA PATTERN
U 1288, 0000,003C,0180,0A48,0000,1289  ;2276           LAB_R[9]                ; WHICH WILL BE USED AS THE TEST VA
U 1289, 001C,2014,0180,0AD0,0082,128A  ;2277           ALU_LA[A+B]D,SC_ALU,R[0A]_ALU
U 128A, 0003,001C,0180,09D0,0200,128B  ;2278           ALU_NOT.MASK,VA_ALU,RC[0A]_ALU
U 128B, 0000,003C,0180,0900,0000,128C  ;2279           LC_RC[0]                ; PTE=RC[0]=A4155555
U 128C, 0010,0038,0180,0AC0,0000,128D  ;2280           R[8]_LC
U 128D, 0000,003C,0180,0910,0000,1148  ;2281           LC_RC[2]
```

```
U 1148, 0010,0039,0180,0AB8,0000,10EE   ;2282   =0      R[7]_LC,CALL,J/TBWR0     ; WRITE GROUP 0 WITH VA=TEST PATTERN
                                        ;2283                                    ; AND PTA=A4155555
U 1149, 0000,003C,0180,0800,0000,1008   ;2284           NOP
U 1008, 0000,003D,0180,0800,0000,123F   ;2285   =000    CALL,J/HIT0              ; READ THIS TEST ADDRESS, SHOULD HIT GROUP 0
U 1009, 0000,003D,0180,0800,0000,120A   ;2286           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 100A, 0000,003D,0180,0800,0000,120A   ;2287           ERROR1          ; A TB MISS TRAP OCCURRED.
U 100B, 0000,003D,0180,0800,0000,120A   ;2288           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 100C, 0000,003D,0180,0800,0000,1223   ;2289           CALL,J/RELCHK            ; CHECK RELOCATED ADDRESS, 0AAAAA80
U 100D, 0000,003D,0180,0800,0000,120A   ;2290           ERROR1          ; A UTRAP OCCURRED.
U 100E, 0000,003D,0180,0800,0000,120A   ;2291           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 100F, 0000,003C,0180,0800,0000,128E   ;2292           NOP
U 128E, 0000,003C,0180,0A50,0082,128F   ;2293           SC_R[0A]                 ; NOW TRY COMPLIMENT ADDRESS IN TEST
U 128F, 0800,0038,0180,0A58,0000,1290   ;2294           ALU_MASK,D_ALU,LAB_R[0B]
U 1290, 001C,2034,0180,09D0,0200,1291   ;2295           ALU_LA[AND]D,VA_ALU,RC[0A]_ALU
U 1291, 0000,003C,0180,0900,0000,1292   ;2296           LC_RC[0]                 ; PTE=RC[0]=A4155555
U 1292, 0010,0038,0180,0AC0,0000,1293   ;2297           R[8]_LC
U 1293, 0000,003C,0180,0910,0000,114A   ;2298           LC_RC[2]
U 114A, 0010,0039,0180,0AB8,0000,10EE   ;2299   =0      R[7]_LC,CALL,J/TBWR0     ; WRITE TEST PATTERN WITH THIS PTE INTO GROUP 0
U 114B, 0000,003C,0180,0800,0000,1010   ;2300           NOP
U 1010, 0000,003D,0180,0800,0000,123F   ;2301   =000    CALL,J/HIT0              ; READ SHOULD HIT GROUP 0
U 1011, 0000,003D,0180,0800,0000,120A   ;2302           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1012, 0000,003D,0180,0800,0000,120A   ;2303           ERROR1          ; A TB MISS TRAP OCCURRED.
U 1013, 0000,003D,0180,0800,0000,120A   ;2304           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1014, 0000,003D,0180,0800,0000,1223   ;2305           CALL,J/RELCHK            ; CHECK RELOCATED ADDRESS, 0AAAAA80
U 1015, 0000,003D,0180,0800,0000,120A   ;2306           ERROR1          ; A UTRAP OCCURRED.
U 1016, 0000,003D,0180,0800,0000,120A   ;2307           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1017, 0000,003C,0180,0800,0000,1294   ;2308           NOP
                                        ;2309   ; GO BACK AND MAKE SURE GROUP 1 IS INTACT.
U 1294, 0010,0038,0180,0938,0200,1295   ;2310           VA_RC[7]                 ; VA=RC[7]=33330000
U 1295, 0010,0038,0180,09D0,0000,1296   ;2311           RC[0A]_LC
U 1296, 0000,003C,0180,0940,0000,1020   ;2312           LC_RC[8]                 ; RELOCATED ADDRESS=RC[8]=05555500
U 1020, 0010,0039,0180,0AB8,0000,124C   ;2313   =000    R[7]_LC,CALL,J/HIT1      ; VA=33330000 SHOULD HIT GROUP 1
U 1021, 0000,003D,0180,0800,0000,120A   ;2314           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1022, 0000,003D,0180,0800,0000,120A   ;2315           ERROR1          ; A TB MISS TRAP OCCURRED.
U 1023, 0000,003D,0180,0800,0000,120A   ;2316           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1024, 0000,003D,0180,0800,0000,1223   ;2317           CALL,J/RELCHK            ; CHECK THE RELOCATED ADDRESS
U 1025, 0000,003D,0180,0800,0000,120A   ;2318           ERROR1          ; A UTRAP OCCURRED.
U 1026, 0000,003D,0180,0800,0000,120A   ;2319           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1027, 0000,003C,0180,0800,0000,114C   ;2320           NOP
                                        ;2321   ;/////////////////////////////////////////////////////////////
                                        ;2322   ; NOW TEST GROUP 1.
                                        ;2323   =0
U 114C, 0000,003D,0180,0800,0000,1209   ;2324   TBAF1:  ERLOOP
U 114D, 0000,003C,0180,0A08,0200,1297   ;2325           VA_R[1]                  ; VA=R[1]=2AAA8000
U 1297, 0000,003C,0180,0A00,0000,114E   ;2326           LAB_R[0]                 ; PTE=R[0]=A4066666
U 114E, 0000,003D,0180,0AC0,0000,10F0   ;2327   =0      R[8]_LA,CALL,J/TBWRB     ; WRITE THIS VA ANDF PTE INTO BOTH GROUPS
U 114F, 0800,003C,0180,0A50,0000,1298   ;2328           D_R[0A]                  ; GENERATE THE TEST ADDRESS PATTERN
U 1298, 0000,003C,0180,0A50,0082,1299   ;2329           SC_R[0A]
U 1299, 0003,001C,0180,09D0,0200,129A   ;2330           ALU_NOT.MASK,VA_ALU,RC[0A]_ALU
U 129A, 0000,003C,0180,0918,0000,129B   ;2331           LC_RC[3]                 ; PTE=RC[3]=A4199999
U 129B, 0010,0038,0180,0AC0,0000,129C   ;2332           R[8]_LC
U 129C, 0000,003C,0180,0928,0000,1150   ;2333           LC_RC[5]
U 1150, 0010,0039,0180,0AB8,0000,10E8   ;2334   =0      R[7]_LC,CALL,J/TBWR1     ; WRITE THE TEST ADDRESS AND PTE=A4199999
                                        ;2335                                    ; INTO GROUP 1
U 1151, 0000,003C,0180,0800,0000,1028   ;2336           NOP
```

```
U 1028, 0000,003D,0180,0800,0000,124C   ;2337   =000    CALL,J/HIT1             ; READ BACK THE HIT IN GROUP 1
U 1029, 0000,003D,0180,0800,0000,120A   ;2338           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 102A, 0000,003D,0180,0800,0000,120A   ;2339           ERROR1          ; A TB MISS TRAP OCCURRED.
U 102B, 0000,003D,0180,0800,0000,120A   ;2340           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 102C, 0000,003D,0180,0800,0000,1223   ;2341           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRES, 0CCCC800
U 102D, 0000,003D,0180,0800,0000,120A   ;2342           ERROR1          ; A UTRAP OCCURRED.
U 102E, 0000,003D,0180,0800,0000,120A   ;2343           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 102F, 0000,003C,0180,0800,0000,129D   ;2344           NOP
U 129D, 0000,003C,0180,0A50,0082,129E   ;2345           SC_R[0A]                ; NOE TRY THE COMPLIMENT ADDRESS PATTERN
U 129E, 0800,0038,0180,0A58,0000,129F   ;2346           ALU_MASK,D_ALU,LAB_R[0B]
U 129F, 001C,2034,0180,09D0,0200,12A0   ;2347           ALU_LA[AND]D,VA_ALU,RC[0A]_ALU
U 12A0, 0000,003C,0180,0918,0000,12A1   ;2348           LC_RC[3]                ; PTE=RC[3]=A4199999
U 12A1, 0010,0038,0180,0AC0,0000,12A2   ;2349           R[8]_LC
U 12A2, 0000,003C,0180,0928,0000,1152   ;2350           LC_RC[5]
U 1152, 0010,0039,0180,0AB8,0000,10E8   ;2351   =0      R[7]_LC,CALL,J/TBWR1    ; WRITE THE TEST PATTERN=VA, AND PTE=A4199999
                                        ;2352                                   ; INTO GROUP 1
U 1153, 0000,003C,0180,0800,0000,1030   ;2353           NOP
U 1030, 0000,003D,0180,0800,0000,124C   ;2354   =000    CALL,J/HIT1             ; READ THE TEST PATTERN, SHOULD HIT GROUP 1
U 1031, 0000,003D,0180,0800,0000,120A   ;2355           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1032, 0000,003D,0180,0800,0000,120A   ;2356           ERROR1          ; A TB MISS TRAP OCCURRED.
U 1033, 0000,003D,0180,0800,0000,120A   ;2357           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1034, 0000,003D,0180,0800,0000,1223   ;2358           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 1035, 0000,003D,0180,0800,0000,120A   ;2359           ERROR1          ; A UTRAP OCCURRED.
U 1036, 0000,003D,0180,0800,0000,120A   ;2360           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1037, 0000,003C,0180,0800,0000,12A3   ;2361           NOP
                                        ;2362   ; GO BACK AND MAKE SURE GROUP 0 IS INTACT.
U 12A3, 0000,003C,0180,0A08,0200,12A4   ;2363           VA_R[1]                 ; R[1]=VA=2AAA8000
U 12A4, 0000,003C,0180,09D0,0000,12A5   ;2364           RC[0A]_LA
U 12A5, 0000,003C,0180,0A10,0000,1040   ;2365           LAB_R[2]                ; R[2]=03333300, THE RELOCATED ADDRESS
U 1040, 0000,003D,0180,0AB8,0000,123F   ;2366   =000    R[7]_LA,CALL,J/HIT0     ; VA=2AAA8000 SHOULD HIT GROUP 0
U 1041, 0000,003D,0180,0800,0000,120A   ;2367           ERROR1          ; A NON TB MISS TRAP OCCURRED.
U 1042, 0000,003D,0180,0800,0000,120A   ;2368           ERROR1          ; A TB MISS TRAP OCCURRED.
U 1043, 0000,003D,0180,0800,0000,120A   ;2369           ERROR1          ; NO TRAP BUT HIT/MISS BIT NOT SET.
U 1044, 0000,003D,0180,0800,0000,1223   ;2370           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 1045, 0000,003D,0180,0800,0000,120A   ;2371           ERROR1          ; A UTRAP OCCURRED.
U 1046, 0000,003D,0180,0800,0000,120A   ;2372           ERROR1          ; NO UTRAP BUT RELOCATION IS INCORRECT.
U 1047, 0000,003C,0180,0800,0000,12A6   ;2373           NOP
U 12A6, 0000,003C,0180,0A20,0010,12A7   ;2374           ALU_R[4],CLK.UBCC       ; HAVE ALL TEST PATTERNS BEEN TRIED?
U 12A7, 0000,013C,0180,0800,0000,1156   ;2375           Z?
U 1156, 0018,0000,0580,0AA0,0000,1144   ;2376   =0      R[4]_LA-K[.1],J/TBAF0   ; IF NOT CONTINUE
U 1157, 0000,003C,0180,0800,0000,1158   ;2377           NOP
```

```
                                            .PAGE   "TEST A7        GROUP 0 COMPARATORS TEST"
                                    ;*****************************************************************
                                    ;++
                                    ; TEST  A7      GROUP 0 COMPARATORS TEST
                                    ;
                                    ; TEST DESCRIPTION
                                    ;       THIS IS A TEST OF THE TB HIT/MISS COMPARATORS OF GROUP 0.
                                    ;       FIRST A TAG OF 0 IS MADE A HIT, THEN A 1 IS FLOATED ACROSS
                                    ;       A FIELD OF 0'S IN THE VA. EACH VA THUS PRODUCED SHOULD BE A
                                    ;       MISS IN THE TB. THEN EACH PATTERN PRODUCED
                                    ;       BY FLOATING A 1 ACROSS A FIELD OF 0'S IS MADE A HIT AND
                                    ;       THE VA ADDRESS OF 0 IS REFERENCED TO GET A MISS.
                                    ;       THE COMPLIMENT OF THE ABOVE PATTERNS IS ALSO TESTED (I.E.
                                    ;       ALL 1'S AND THE PATTERNS PRODUCED BY FLOATING A 0
                                    ;       ACROSS A FIELD OF 1'S.
                                    ;
                                    ; ERROR DESCRIPTION
                                    ;       EXPECTED TBER0 (IF CHECKING HIT/MISS BITS)
                                    ;               OR GOT TBER1 (IF UNEXPECTED UTRAP OCCURRED)
                                    ;       ACTUAL TBER0
                                    ;       EXPECTED TIME OUT ADDRESS REGISTER
                                    ;       ACTUAL TIME OUT ADDRESS REGISTER
                                    ;       FLOATING PATTERN CURRENTLY IN USE
                                    ;       UTRAP FLAG (IF UNEXPECTED UTRAP OCCURS)
                                    ;               FLAG            UTRAP TYPE
                                    ;               ----            ----------
                                    ;               DE              NO UTRAP OCCURRED
                                    ;               5E              TB PARITY ERROR
                                    ;               9E              TB MISS
                                    ;               CE              TB PROTECTION ERROR
                                    ;               D6              TB MODIFY BIT ERROR
                                    ;               DA              X PAGE UTRAP
                                    ;               DC              UNALIGNED DATA UTRAP
                                    ;
                                    ;--
                                    ;*****************************************************************
                                    =0
U 1158, 0000,003D,0180,0800,0000,11F2   TBHM0:  NEWTST
U 1159, 0018,0038,D580,09F8,0000,115A           RC[OF]_K[.6]
U 115A, 0000,003D,0180,0800,0000,1213   =0      CALL,J7CSOFF            ; TURN OFF THE CACHE AND SBI CYCLES
U 115B, 0000,003C,0180,0800,0000,115C           NOP
U 115C, 0F00,003D,0180,0800,0000,105C   =0      D_0,CALL,J/DC.DE
U 115D, 0001,003C,0180,0AF0,0000,115E           R[OE]_D                 ; SET UP THE UTRAP FLAG, R[OE]=DE
U 115E, 0000,003D,0180,0800,0000,1269   =0      CALL,J/TBWPTP           ; GENERATE SOME TEST DATA PATTERNS
U 115F, 0818,0038,6580,0AA0,0000,12A8           R[4]_K[.10],D_K[.10]    ; R[4]=.10, A COUNTER
U 12A8, 0819,0000,0980,0AC8,0000,1160           D_D-R[.2],R[9]_ALU      ; R[9]=.E
                                    ;///////7///////////////////7/////////////////////////////////////
                                    ; FIRST MAKE
                                    ;       VA=00000000
                                    ;       PTE=A40AAAAA
                                    ; A HIT IN GROUP 0
                                    ; CHECK THIS HIT IN GROUP 0.
                                    ; THEN REFERENCE A TEST VA GENERATED BY FLOATING A 1 THROUGH 0'S
                                    ; AND MAKE SURE THIS FLOATING TEST PATTERN IS A MISS.
                                    ;
```

```
U 1160, 0000,003D,0180,0800,0000,1209   ;2433   =0      ERLOOP
U 1161, 0010,0038,0180,0920,0200,12A9   ;2434   TBHM0A: VA_RC[4]                ; VA=55554000
U 12A9, 0000,003C,0180,0918,0000,1162   ;2435           LC_RC[3]                ; PTE=A4199999
U 1162, 0010,0039,0180,0AC0,0000,10F0   ;2436   =0      R[8]_LC,CALL,J/TBWRB    ; WRITE THIS PATTERN INTO BOTH TB GROUPS
U 1163, 0018,0038,1980,09D0,0200,12AB   ;2437           ALU_0(K),VA_ALU,RC[0A]_ALU ; VA=0
U 12AB, 0000,003C,0180,0930,0000,1164   ;2438           LC_RC[6]                ; A40AAAAA
U 1164, 0010,0039,0180,0AC0,0000,10EE   ;2439   =0      R[8]_LC,CALL,J/TBWR0    ; WRITE VA=0 INTO GROUP 0
U 1165, 0000,003C,0180,0940,0000,1050   ;2440           LC_RC[8]                ; RC[8]=05555500 WHICH IS THE EXPECTED
                                        ;2441                                   ; RELOCATION OF VA=0 AS IT
                                        ;2442                                   ; WILL APPEAR IN THE TIME OUT ADDRESS REG.
U 1050, 0010,0039,0180,0AB8,0000,123F   ;2443   =000    R[7]_LC,CALL,J/HIT0     ; READ VA=0, SHOULD HIT GROUP 0
U 1051, 0000,003D,0180,0800,0000,120A   ;2444           ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 1052, 0000,003D,0180,0800,0000,120A   ;2445           ERROR1          ; A TB MISS UTRAP OCCURRED
U 1053, 0000,003D,0180,0800,0000,120A   ;2446           ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 1054, 0000,003D,0180,0800,0000,1223   ;2447           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESSOF VA=0
U 1055, 0000,003D,0180,0800,0000,120A   ;2448           ERROR1          ; A UTRAP OCCURRED
U 1056, 0000,003D,0180,0800,0000,120A   ;2449           ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 1057, 0000,003C,0180,0800,0000,12AC   ;2450           NOP
U 12AC, 0800,003C,0180,0A20,0000,12AD   ;2451           D_R[4]                  ; GENERATE THE TEST ADDRESS
U 12AD, 0000,003C,0180,0A48,0000,12AE   ;2452           LAB_R[9]                ; OF A 1 IN A FIELD OF ZEROES
U 12AE, 001C,2014,0180,0AD0,0082,12AF   ;2453           ALU_LA[A+B]D,SC_ALU,R[0A]_ALU
U 12AF, 0003,001C,0180,0AA8,0200,12B0   ;2454           ALU_NOT.MASK,VA_ALU,R[5]_ALU ; PUT THIS TEST PATTERN INTO THE VA
U 12B0, 0003,001C,0180,09D0,0000,1004   ;2455           ALU_NOT.MASK,RC[0A]_ALU
U 1004, 0000,003D,0180,0800,0000,1234   ;2456   =00     CALL,J/MISS             ; CHECK FOR A MISS AT VA=TEST PATTERN
U 1005, 0000,003D,0180,0800,0000,120A   ;2457           ERROR1          ; NO UTRAP OCCURRED (EXPECTED TB MISS)
U 1006, 0000,003D,0180,0800,0000,120A   ;2458           ERROR1          ; UTRAPPED BUT NOT BECAUSE OF TB MISS
U 1007, 0000,003C,0180,0800,0000,12B1   ;2459           NOP
                                        ;2460   ;/////////////////////////////////////////////////////////////
                                        ;2461   ; MAKE
                                        ;2462   ;       VA= TEST PATTERN GENERATED BY FLOATING A 1 THROUGH 0'S
                                        ;2463   ;       PTE=A4066666
                                        ;2464   ; A HIT IN GROUP 0.
                                        ;2465   ; CHECK THIS HIT, THEN REFERENCE VA=0 AND MAKE SURE IT IS A MISS
                                        ;2466   ;
U 12B1, 0000,003C,0180,0A00,0000,12B2   ;2467           LAB_R[0]                ; R[0]=PTE=A4066666
U 12B2, 0000,003C,0180,0AC0,0000,12B3   ;2468           R[8]_LA
U 12B3, 0000,003C,0180,0A10,0000,1166   ;2469           LAB_R[2]
U 1166, 0000,003D,0180,0AB8,0000,10EE   ;2470   =0      R[7]_LA,CALL,J/TBWR0    ; WRITE FLOATING VA PATTERN INTO GROUP 0
U 1167, 0000,003C,0180,0800,0000,1060   ;2471           NOP
U 1060, 0000,003D,0180,0800,0000,123F   ;2472   =000    CALL,J/HIT0             ; CHECK FOR HIT IN GROUP 0
U 1061, 0000,003D,0180,0800,0000,120A   ;2473           ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 1062, 0000,003D,0180,0800,0000,120A   ;2474           ERROR1          ; A TB MISS UTRAP OCCURRED
U 1063, 0000,003D,0180,0800,0000,120A   ;2475           ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 1064, 0000,003D,0180,0800,0000,1223   ;2476           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS OF THIS
                                        ;2477                                   ; REFERENCE, WILL BE 03333300
                                        ;2478                                   ; IN THE TIME OUT ADDRESS REGISTER
U 1065, 0000,003D,0180,0800,0000,120A   ;2479           ERROR1          ; A UTRAP OCCURRED
U 1066, 0000,003D,0180,0800,0000,120A   ;2480           ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 1067, 0000,003C,0180,0800,0000,12B4   ;2481           NOP
U 12B4, 0018,0038,1980,0800,0200,1018   ;2482           ALU_0(K),VA_ALU         ; SET VA=0
U 1018, 0000,003D,0180,0800,0000,1234   ;2483   =00     CALL,J/MISS             ; MAKE SURE VA=0 IS A MISS
U 1019, 0000,003D,0180,0800,0000,120A   ;2484           ERROR1          ; NO UTRAP OCCURRED (EXPECTED TB MISS)
U 101A, 0000,003D,0180,0800,0000,120A   ;2485           ERROR1          ; UTRAPPED BUT NOT BECAUSE OF TB MISS
U 101B, 0000,003C,0180,0800,0000,12B5   ;2486           NOP
                                        ;2487   ;/////////////////////////////////////////////////////////////
```

```
                                          ;2488    ; MAKE
                                          ;2489    ;        VA=7FFFC000
                                          ;2490    ;        PTE=A40AAAAA
                                          ;2491    ; A HIT IN GROUP 0. CHECK THIS HIT IN GROUP 0.
                                          ;2492    ; THEN REFERENCE AN ADDRESS GENERATED BY FLOATING A 0 THROUGH
                                          ;2493    ; A FIELD OF 1'S AND MAKE SURE THIS TEST PATTERN IS A MISS
                                          ;2494    ;
U 12B5, 0000,003C,0180,0A58,0200,12B6     ;2495            ALU_R[0B],VA_ALU         ; VA=7FFFC000
U 12B6, 0000,003C,0180,09D0,0000,12B7     ;2496            RC[0A]_LA
U 12B7, 0000,003C,0180,0930,0000,1168     ;2497            LC_RC[6]                 ; RC[6]=PTE=A40AAAAA
U 1168, 0010,0039,0180,0AC0,0000,10EE     ;2498    =0      R[8]_LC,CALL,J/TBWR0     ; WRITE VA=7FFFC000 INTO GROUP 0
U 1169, 0000,003C,0180,0940,0000,1068     ;2499            LC_RC[8]                 ; RC[8]=05555500 WHICH WILL BE THE RELOCATED
                                          ;2500                                     ; ADDRESS AS IT APPEARS IN THE
                                          ;2501                                     ; TIME OUT ADDRESS REGISTER
U 1068, 0010,0039,0180,0AB8,0000,123F     ;2502    =000    R[7]_LC,CALL,J/HIT0      ; CHECK HIT IN GROUP 0 AT VA=7FFFC000
U 1069, 0000,003D,0180,0800,0000,120A     ;2503            ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 106A, 0000,003D,0180,0800,0000,120A     ;2504            ERROR1          ; A TB MISS UTRAP OCCURRED
U 106B, 0000,003D,0180,0800,0000,120A     ;2505            ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 106C, 0000,003D,0180,0800,0000,1223     ;2506            CALL,J/RELCHK            ; CHECK THE RELOCATED ADDRESS
U 106D, 0000,003D,0180,0800,0000,120A     ;2507            ERROR1          ; A UTRAP OCCURRED
U 106E, 0000,003D,0180,0800,0000,120A     ;2508            ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 106F, 0000,003C,0180,0800,0000,12B8     ;2509            NOP
U 12B8, 0000,003C,0180,0A50,0082,12B9     ;2510            ALU_R[0A],SC_ALU         ; GENERATE THE TEST PATTERN
U 12B9, 0800,0038,0180,0A58,0000,12BA     ;2511            ALU_MASK,D_ALU,LAB_R[0B] ; OF A 0 IN A FIELD OF 1'S
U 12BA, 001C,2034,0180,0AA8,0200,12BB     ;2512            ALU_LA[AND]D,VA_ALU,R[5]_ALU ; PUT THE TEST PATTERN INTO THE VA
U 12BB, 001C,2034,0180,09D0,0000,1038     ;2513            ALU_LA[AND]D,RC[0A]_ALU
U 1038, 0000,003D,0180,0800,0000,1234     ;2514    =00     CALL,J/MISS              ; MAKE SURE THIS TEST PATTERN IS A MISS
U 1039, 0000,003D,0180,0800,0000,120A     ;2515            ERROR1          ; NO UTRAP OCCURRED (EXPECTED TB MISS)
U 103A, 0000,003D,0180,0800,0000,120A     ;2516            ERROR1          ; UTRAPPED BUT NOT BECAUSE OF TB MISS
U 103B, 0000,003C,0180,0800,0000,12BC     ;2517            NOP
                                          ;2518    ;////////////////////////////////////////////////////////////////
                                          ;2519    ; MAKE
                                          ;2520    ;        VA=TEST PATTERN GENERATED BY FLOATING A 0 THROUGH 1'S
                                          ;2521    ;        PTE=A4066666
                                          ;2522    ; A HIT IN GROUP 0. CHECK THIS HIT.
                                          ;2523    ; THEN REFERENCE VA=7FFFC000 AND MAKE SURE IT IS A MISS.
                                          ;2524    ;
U 12BC, 0000,003C,0180,0A00,0000,116A     ;2525            LAB_R[0]                 ; R[0]=A4066666=PTE
U 116A, 0000,003D,0180,0AC0,0000,10EE     ;2526    =0      R[8]_LA,CALL,J/TBWR0     ; WRITE THE FLOATING 0 PATTERN INTO GROUP 0
U 116B, 0000,003C,0180,0A10,0000,1070     ;2527            LAB_R[2]                 ; R[2]=03333300 WHICH IS THE RELOCATED
                                          ;2528                                     ; ADDRESS AS IT WILL APPEAR IN THE
                                          ;2529                                     ; TIME OUT ADDRESS REGISTER
U 1070, 0000,003D,0180,0AB8,0000,123F     ;2530    =000    R[7]_LA,CALL,J/HIT0      ; CHECK THE TEST PATTERNS HIT IN GROUP 0
U 1071, 0000,003D,0180,0800,0000,120A     ;2531            ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 1072, 0000,003D,0180,0800,0000,120A     ;2532            ERROR1          ; A TB MISS UTRAP OCCURRED
U 1073, 0000,003D,0180,0800,0000,120A     ;2533            ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 1074, 0000,003D,0180,0800,0000,1223     ;2534            CALL,J/RELCHK            ; CHECK THE RELOCATED ADDRESS
U 1075, 0000,003D,0180,0800,0000,120A     ;2535            ERROR1          ; A UTRAP OCCURRED
U 1076, 0000,003D,0180,0800,0000,120A     ;2536            ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 1077, 0000,003C,0180,0800,0000,12BD     ;2537            NOP
U 12BD, 0000,003C,0180,0A58,0200,1048     ;2538            ALU_R[0B],VA_ALU         ; VA=7FFFC000
U 1048, 0000,003D,0180,0800,0000,1234     ;2539    =00     CALL,J/MISS              ; MAKE SURE VA=7FFFC000 IS A MISS
U 1049, 0000,003D,0180,0800,0000,120A     ;2540            ERROR1          ; NO UTRAP OCCURRED (EXPECTED TB MISS)
U 104A, 0000,003D,0180,0800,0000,120A     ;2541            ERROR1          ; UTRAPPED BUT NOT BECAUSE OF TB MISS
U 104B, 0000,003C,0180,0800,0000,12BE     ;2542            NOP
```

```
                                          ;2543     ;///////////////////////////////////////////////////////////////////
                                          ;2544     ; MAKE SURE GROUP 1 IS STILL INTACT.
U 12BE, 0010,0038,0180,0920,0200,12BF     ;2545             ALU_RC[4],VA_ALU          ; RC[4]=55554000
U 12BF, 0010,0038,0180,09D0,0000,12C0     ;2546             RC[0A]_LC
U 12C0, 0000,003C,0180,0928,0000,1080     ;2547             LC_RC[5]                  ; RC[5]=0CCCC80, THE RELOCATED ADDRESS
U 1080, 0010,0039,0180,0AB8,0000,124C     ;2548     =000    R[7]_LC,CALL,J/HIT1       ; CHECK FOR HIT IN GROUP 1
U 1081, 0000,003D,0180,0800,0000,120A     ;2549             ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 1082, 0000,003D,0180,0800,0000,120A     ;2550             ERROR1          ; A TB MISS UTRAP OCCURRED
U 1083, 0000,003D,0180,0800,0000,120A     ;2551             ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 1084, 0000,003D,0180,0800,0000,1223     ;2552             CALL,J/RELCHK             ; CHECK THE RELOCATED ADDRESS
U 1085, 0000,003D,0180,0800,0000,120A     ;2553             ERROR1          ; A UTRAP OCCURRED
U 1086, 0000,003D,0180,0800,0000,120A     ;2554             ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 1087, 0000,003C,0180,0800,0000,12C1     ;2555             NOP
U 12C1, 0000,003C,0180,0A20,0010,12C2     ;2556             ALU_R[4],CLK.UBCC         ; SEE IF ALL FLOATING TEST PATTERNS HAVE
U 12C2, 0000,013C,0180,0800,0000,116C     ;2557             Z?                        ; BEEN TRIED.
U 116C, 0018,0000,0580,0AA0,0000,1161     ;2558     =0      R[4]_LA-K[.1],J/TBHM0A    ; IF NOT CONTINUE
U 116D, 0000,003C,0180,0800,0000,116E     ;2559             NOP
```

```
                                                  .PAGE   "TEST A8        GROUP 1 COMPARATORS TEST"
                                          ;*****************************************************************
                                          ;++
                                          ; TEST  A8      GROUP 1 COMPARATORS TEST
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS IS A TEST OF THE TB HIT/MISS COMPARATORS OF GROUP 1.
                                          ;       FIRST A TAG OF 0 IS MADE A HIT, THEN A 1 IS FLOATED ACROSS
                                          ;       A FIELD OF 0'S IN THE VA. EACH VA THUS PRODUCED SHOULD BE A
                                          ;       MISS IN THE TB. THEN EACH PATTERN PRODUCED
                                          ;       BY FLOATING A 1 ACROSS A FIELD OF 0'S IS MADE A HIT AND
                                          ;       THE VA ADDRESS OF 0 IS REFERENCED TO GET A MISS.
                                          ;       THE COMPLIMENT OF THE ABOVE PATTERNS IS ALSO TESTED (I.E.
                                          ;       ALL 1'S AND THE PATTERNS PRODUCED BY FLOATING A 0
                                          ;       ACROSS A FIELD OF 1'S.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       EXPECTED TBER0 (IF CHECKING HIT/MISS BITS)
                                          ;               OR GOT TBER1 (IF UNEXPECTED UTRAP OCCURRED)
                                          ;       ACTUAL TBER0
                                          ;       EXPECTED TIME OUT ADDRESS REGISTER
                                          ;       ACTUAL TIME OUT ADDRESS REGISTER
                                          ;       FLOATING PATTERN CURRENTLY IN USE
                                          ;       UTRAP FLAG (IF UNEXPECTED UTRAP OCCURS)
                                          ;               FLAG            UTRAP TYPE
                                          ;               ----            ----------
                                          ;               DE              NO UTRAP OCCURRED
                                          ;               5E              TB PARITY ERROR
                                          ;               9E              TB MISS
                                          ;               CE              TB PROTECTION ERROR
                                          ;               D6              TB MODIFY BIT ERROR
                                          ;               DA              X PAGE UTRAP
                                          ;               DC              UNALIGNED DATA UTRAP
                                          ;
                                          ;--
                                          ;*****************************************************************
                                          =0
U 116E, 0000,003D,0180,0800,0000,11F2     TBHM1:  NEWTST
U 116F, 0016,0038,D580,09F8,0000,1170             RC[0F]_K[.6]
U 1170, 0000,003D,0180,0800,0000,1213     =0      CALL,J7CSOFF             ; TURN OFF THE CACHE AND SBI CYCLES
U 1171, 0000,003C,0180,0800,0000,1172             NOP
U 1172, 0F00,003D,0180,0800,0000,105C     =0      D_0,CALL,J/DC.DE
U 1173, 0001,003C,0180,0AF0,0000,1174             R[0E]_D                  ; SET UP THE UTRAP FLAG, R[0E]=DE
U 1174, 0000,003D,0180,0800,0000,1269     =0      CALL,J/TBWPTP            : GENERATE SOME TEST DATA PATTERNS
U 1175, 0818,0038,6580,0AA0,0000,12C3             R[4]_K[.10],D_K[.10]     ; R[4]=.10, A COUNTER
U 12C3, 0819,0000,0980,0AC8,0000,1176             D_D-R[.2],R[9]_ALU       ; R[9]=.E
                                          ;///////7///////////////7////////////////////////////////////////
                                          ; FIRST MAKE
                                          ;       VA=00000000
                                          ;       PTE=A40AAAAA
                                          ; A HIT IN GROUP 1 AND CHECK THIS HIT.
                                          ; THEN REFERENCE VA= A TEST PATTERN GENERATED BY FLOATING A 1 THROUGH
                                          ; A FIELD OF ZEROES AND MAKE SURE THIS TEST PATTERN IS A MISS.
                                          ;
U 1176, 0000,003D,0180,0800,0000,1209     =0      ERLOOP
```

```
U 1177, 0010,0038,0180,0920,0200,12C4   ;2615   TBHM1A: VA_RC[4]                  ; VA=55554000
U 12C4, 0000,003C,0180,0918,0000,1178   ;2616           LC_RC[3]                  ; RC[3]=PTE=A4199999
U 1178, 0010,0039,0180,0AC0,0000,10F0   ;2617   =0      R[8]_LC,CALL,J/TBWRB      ; MAKE VA=55554000 A HIT IN BOTH GROUPS
U 1179, 0018,0038,1980,09D0,0200,12C5   ;2618           ALU_0(K),VA_ALU,RC[0A]_ALU ; VA=0
U 12C5, 0000,003C,0180,0930,0000,117A   ;2619           LC_RC[6]                  ; RC[6]=PTE=A40AAAAA
U 117A, 0010,0039,0180,0AC0,0000,10E8   ;2620   =0      R[8]_LC,CALL,J/TBWR1      ; WRITE VA=0 INTO GROUP 1
U 117B, 0000,003C,0180,0940,0000,1088   ;2621           LC_RC[8]                  ; RC[8]=05555500 THE EXPECTED RELOCATED
                                        ;2622                                     ; ADDRESS AS IT WILL APPEAR IN THE
                                        ;2623                                     ; TIME OUT ADDRESS REGISTER
U 1088, 0010,0039,0180,0AB8,0000,124C   ;2624   =000    R[7]_LC,CALL,J/HIT1       ; CHECK A HIT IN GROUP 1 AT VA=0
U 1089, 0000,003D,0180,0800,0000,120A   ;2625           ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 108A, 0000,003D,0180,0800,0000,120A   ;2626           ERROR1          ; A TB MISS UTRAP OCCURRED
U 108B, 0000,003D,0180,0800,0000,120A   ;2627           ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 108C, 0000,003D,0180,0800,0000,1223   ;2628           CALL,J/RELCHK             ; CHECK THE RELOCATED ADDRESS
U 108D, 0000,003D,0180,0800,0000,120A   ;2629           ERROR1          ; A UTRAP OCCURRED
U 108E, 0000,003D,0180,0800,0000,120A   ;2630           ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 108F, 0000,003C,0180,0800,0000,12C6   ;2631           NOP
U 12C6, 0800,003C,0180,0A20,0000,12C7   ;2632           D_R[4]                    ; GENERATE THE TEST ADDRESS
U 12C7, 0000,003C,0180,0A48,0000,12C8   ;2633           LAB_R[9]                  ; OF A 1 IN A FIELD OF 0'S
U 12C8, 001C,2014,0180,0AD0,0082,12C9   ;2634           ALU_LA[A+B]D,SC_ALU,R[0A]_ALU
U 12C9, 0003,001C,0180,0AA8,0200,12CA   ;2635           ALU_NOT.MASK,VA_ALU,R[5]_ALU ; PUT THIS TEST PATTERN INTO THE VA
U 12CA, 0003,001C,0180,09D0,0000,1078   ;2636           ALU_NOT.MASK,RC[0A]_ALU
U 1078, 0000,003D,0180,0800,0000,1234   ;2637   =00     CALL,J/MISS               ; MAKE SURE THIS TEST PATTERN IS A MISS
U 1079, 0000,003D,0180,0800,0000,120A   ;2638           ERROR1          ; NO UTRAP OCCURRED (EXPECTED TB MISS)
U 107A, 0000,003D,0180,0800,0000,120A   ;2639           ERROR1          ; UTRAPPED BUT NOT BECAUSE OF TB MISS
U 107B, 0000,003C,0180,0800,0000,12CB   ;2640           NOP
                                        ;2641   ;///////////////////////////////////////////////////////
                                        ;2642   ; MAKE
                                        ;2643   ;       VA= TEST PATTERN GENERATED BY FLOATING A 1 THROUGH A FIELD OF 0'S
                                        ;2644   ;       PTE=A4066666
                                        ;2645   ; A HIT IN GROUP 1 AND CHECK THIS HIT.
                                        ;2646   ; THEN REFERENCE VA=0 AND MAKE SURE THIS ADDRESS IS A MISS
                                        ;2647   ;
U 12CB, 0000,003C,0180,0A00,0000,12CC   ;2648           LAB_R[0]                  ; R[0]=PTE=A4066666
U 12CC, 0000,003C,0180,0AC0,0000,12CD   ;2649           R[8]_LA
U 12CD, 0000,003C,0180,0A10,0000,1180   ;2650           LAB_R[2]
U 1180, 0000,003D,0180,0AB8,0000,10E8   ;2651   =0      R[7]_LA,CALL,J/TBWR1      ; WRITE FLOATING VA PATTERN INTO GROUP 1
U 1181, 0000,003C,0180,0800,0000,1090   ;2652           NOP
U 1090, 0000,003D,0180,0800,0000,124C   ;2653   =000    CALL,J/HIT1               ; CHECK THIS HIT IN GROUP 1
U 1091, 0000,003D,0180,0800,0000,120A   ;2654           ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 1092, 0000,003D,0180,0800,0000,120A   ;2655           ERROR1          ; A TB MISS UTRAP OCCURRED
U 1093, 0000,003D,0180,0800,0000,120A   ;2656           ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 1094, 0000,003D,0180,0800,0000,1223   ;2657           CALL,J/RELCHK             ; CHECK THE RELOCATED ADDRESS
U 1095, 0000,003D,0180,0800,0000,120A   ;2658           ERROR1          ; A UTRAP OCCURRED
U 1096, 0000,003D,0180,0800,0000,120A   ;2659           ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 1097, 0000,003C,0180,0800,0000,12CE   ;2660           NOP
U 12CE, 0018,0038,1980,0800,0200,1098   ;2661           ALU_0(K),VA_ALU           ; SET VA=0
U 1098, 0000,003D,0180,0800,0000,1234   ;2662   =00     CALL,J/MISS               ; MAKE SURE VA=0 IS A MISS
U 1099, 0000,003D,0180,0800,0000,120A   ;2663           ERROR1          ; NO UTRAP OCCURRED (EXPECTED TB MISS)
U 109A, 0000,003D,0180,0800,0000,120A   ;2664           ERROR1          ; UTRAPPED BUT NOT BECAUSE OF TB MISS
U 109B, 0000,003C,0180,0800,0000,12CF   ;2665           NOP
                                        ;2666   ;///////////////////////////////////////////////////////
                                        ;2667   ; MAKE
                                        ;2668   ;       VA=7FFFC000
                                        ;2669   ;       PTE=A40AAAAA
                                        ;2670   ; A HIT IN GROUP 1 AND CHECK THAT HIT.
                                        ;2671   ; THEN REFERENCE VA= A PATTERN GENERATED BY FLOATING A 0 THROUGH A
                                        ;2672   ; FIELD OF 1'S AND MAKE SURE THIS TEST PATTERN IS A MISS
                                        ;2673   ;
U 12CF, 0000,003C,0180,0A58,0200,12D0   ;2674           ALU_R[0B],VA_ALU        ; VA=7FFFC000
U 12D0, 0000,003C,0180,09D0,0000,12D1   ;2675           RC[0A]_LA
U 12D1, 0000,003C,0180,0930,0000,1182   ;2676           LC_RC[6]                ; RC[6]=PTE=A40AAAAA
U 1182, 0010,0039,0180,0AC0,0000,10E8   ;2677   =0      R[8]_LC,CALL,J/TBWR1    ; WRITE VA=7FFFC000 INTO GROUP 1
U 1183, 0000,003C,0180,0940,0000,10A0   ;2678           LC_RC[8]
U 10A0, 0010,0039,0180,0AB8,0000,124C   ;2679   =000    R[7]_LC,CALL,J/HIT1     ; CHECK FOR A HIT IN GROUP 1 AT VA=7FFFC000
U 10A1, 0000,003D,0180,0800,0000,120A   ;2680           ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 10A2, 0000,003D,0180,0800,0000,120A   ;2681           ERROR1          ; A TB MISS UTRAP OCCURRED
U 10A3, 0000,003D,0180,0800,0000,120A   ;2682           ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 10A4, 0000,003D,0180,0800,0000,1223   ;2683           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 10A5, 0000,003D,0180,0800,0000,120A   ;2684           ERROR1          ; A UTRAP OCCURRED
U 10A6, 0000,003D,0180,0800,0000,120A   ;2685           ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 10A7, 0000,003C,0180,0800,0000,12D2   ;2686           NOP
U 12D2, 0000,003C,0180,0A50,0082,12D3   ;2687           ALU_R[0A],SC_ALU        ; GENERATE THE TEST PATTERN
U 12D3, 0800,0038,0180,0A58,0000,12D4   ;2688           ALU_MASK,D_A[U,LAB_R[0B] ; A 0 IN A FIELD OF 1'S
U 12D4, 001C,2034,0180,0AA8,0200,12D5   ;2689           ALU_LA[AND]D,VA_ALU,R[5]_ALU ; PUT THE TEST PATTERN INTO THE VA
U 12D5, 001C,2034,0180,09D0,0000,10D8   ;2690           ALU_LA[AND]D,RC[0A]_ALU
U 10D8, 0000,003D,0180,0800,0000,1234   ;2691   =00     CALL,J/MISS             ; MAKE SURE IT IS A MISS IN THE TB
U 10D9, 0000,003D,0180,0800,0000,120A   ;2692           ERROR1          ; NO UTRAP OCCURRED (EXPECTED TB MISS)
U 10DA, 0000,003D,0180,0800,0000,120A   ;2693           ERROR1          ; UTRAPPED BUT NOT BECAUSE OF TB MISS
U 10DB, 0000,003C,0180,0800,0000,12D6   ;2694           NOP
                                        ;2695   ;///////////////////////////////////////////////////////////////////
                                        ;2696   ; MAKE
                                        ;2697   ;       VA= TEST PATTERN GENERATED BY FLOATING A 0 THROUGH A FIELD OF 1'S
                                        ;2698   ;       PTE=A4066666
                                        ;2699   ; A HIT IN GROUP 1 AND CHECK THIS HIT.
                                        ;2700   ; THEN REFERENCE VA=7FFFC000 AND MAKE SURE THIS ADDRESS IS A TB MISS
                                        ;2701   ;
U 12D6, 0000,003C,0180,0A00,0000,1184   ;2702           LAB_R[0]                        ; R[0]=PTE=A4066666
U 1184, 0000,003D,0180,0AC0,0000,10E8   ;2703   =0      R[8]_LA,CALL,J/TBWR1    ; WRITE THE VA=TEST PATTERN INTO GROUP 1
U 1185, 0000,003C,0180,0A10,0000,10A8   ;2704           LAB_R[2]
U 10A8, 0000,003D,0180,0AB8,0000,124C   ;2705   =000    R[7]_LA,CALL,J/HIT1     ; CHECK THIS HIT IN GROUP 1
U 10A9, 0000,003D,0180,0800,0000,120A   ;2706           ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 10AA, 0000,003D,0180,0800,0000,120A   ;2707           ERROR1          ; A TB MISS UTRAP OCCURRED
U 10AB, 0000,003D,0180,0800,0000,120A   ;2708           ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 10AC, 0000,003D,0180,0800,0000,1223   ;2709           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 10AD, 0000,003D,0180,0800,0000,120A   ;2710           ERROR1          ; A UTRAP OCCURRED
U 10AE, 0000,003D,0180,0800,0000,120A   ;2711           ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 10AF, 0000,003C,0180,0800,0000,12D7   ;2712           NOP
U 12D7, 0000,003C,0180,0A58,0200,10DC   ;2713           ALU_R[0B],VA_ALU        ; VA=7FFFC000
U 10DC, 0000,003D,0180,0800,0000,1234   ;2714   =00     CALL,J/MISS             ; VA SHOULD NOW BE A MISS
U 10DD, 0000,003D,0180,0800,0000,120A   ;2715           ERROR1          ; NO UTRAP OCCURRED (EXPECTED TB MISS)
U 10DE, 0000,003D,0180,0800,0000,120A   ;2716           ERROR1          ; UTRAPPED BUT NOT BECAUSE OF TB MISS
U 10DF, 0000,003C,0180,0800,0000,12D8   ;2717           NOP
                                        ;2718   ;///////////////////////////////////////////////////////////////////
                                        ;2719   ; MAKE SURE GROUP 0 IS STILL INTACT.
U 12D8, 0010,0038,0180,0920,0200,12D9   ;2720           ALU_RC[4],VA_ALU        ; VA=55554000
U 12D9, 0010,0038,0180,09D0,0000,12DA   ;2721           RC[0A]_LC
U 12DA, 0000,003C,0180,0928,0000,10B0   ;2722           LC_RC[5]
U 10B0, 0010,0039,0180,0AB8,0000,123F   ;2723   =000    R[7]_LC,CALL,J/HIT0     ; MAKE SURE VA=55554000 IS A HIT IN GROUP 0
U 10B1, 0000,003D,0180,0800,0000,120A   ;2724           ERROR1          ; A NON TB MISS UTRAP OCCURRED
```

```
U 10B2, 0000,003D,0180,0800,0000,120A   ;2725           ERROR1          ; A TB MISS UTRAP OCCURRED
U 10B3, 0000,003D,0180,0800,0000,120A   ;2726           ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 10B4, 0000,003D,0180,0800,0000,1223   ;2727           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 10B5, 0000,003D,0180,0800,0000,120A   ;2728           ERROR1          ; A UTRAP OCCURRED
U 10B6, 0000,003D,0180,0800,0000,120A   ;2729           ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 10B7, 0000,003C,0180,0800,0000,12DB   ;2730           NOP
U 12DB, 0000,003C,0180,0A20,0010,12DC   ;2731           ALU_R[4],CLK.UBCC       ; HAVE ALL PATTERNS BEEN TRIED?
U 12DC, 0000,013C,0180,0800,0000,1186   ;2732           Z?
U 1186, 0018,0000,0580,0AA0,0000,1177   ;2733   =0      R[4]_LA-K[.1],J/TBHM1A  ; IF NOT CONTINUE.
U 1187, 0000,003C,0180,0800,0000,1188   ;2734           NOP
```

```
                                        .PAGE   "TEST A9        TB PARITY LOGIC TEST"
                                ;**************************************************************
                                ;++
                                ; TEST  A9      TB PARITY LOGIC TEST
                                ;
                                ; TEST DESCRIPTION
                                ;       THIS IS A TEST OF THE TB PARITY LOGIC USING THE MAINTENANCE
                                ;       FEATURES IN TBER0. A PARITY ERROR IS FORCED AT EACH PARITY
                                ;       CHECKER OF EACH GROUP. THIS SHOULD RESULT IN A UTRAP
                                ;       AND THE APPROPRIATE BITS IN TBER1 SHOULD GET SET.
                                ;
                                ; ERROR DESCRIPTION
                                ;       ADDRESS WRITTEN, VA
                                ;       DATA WRITTEN, PTE
                                ;       EXPECTED TBER1
                                ;       GOT TBER1
                                ;       WROTE TBER0
                                ;       READ TBER0
                                ;       UTRAP FLAG
                                ;               FLAG            UTRAP TYPE
                                ;               ----            ----------
                                ;               DE              NO UTRAP OCCURRED
                                ;               5E              TB PARITY ERROR
                                ;               9E              TB MISS
                                ;               CE              TB PROTECTION ERROR
                                ;               D6              TB MODIFY BIT ERROR
                                ;               DA              X PAGE UTRAP
                                ;               DC              UNALIGNED DATA UTRAP
                                ;
                                ;--
                                ;**************************************************************
                                =0
U 1188, 0000,003D,0180,0800,0000,11F2   TBPAR:  NEWTST
U 1189, 0018,0038,5D80,09F8,0000,118A           RC[0F]_K[.7]
U 118A, 0000,003D,0180,0800,0000,1213   =0      CALL,J7CSOFF            ; TURN OFF THE CACHE AND SBI CYCLES
U 118B, 0000,003C,0180,0800,0000,118C           NOP
U 118C, 0000,003D,0180,0800,0000,1269   =0      CALL,J/TBWPTP           ; GENERATE SOME TEST DATA PATTERNS
U 118D, 0000,003C,0180,0800,0000,118E           NOP
U 118E, 0F00,003D,0180,0800,0000,105C   =0      D_0,CALL,J/DC.DE
U 118F, 0001,003C,0180,0AF0,0000,12DD           R[0E]_D                 ; SET UP THE UTRAP FLAG, R[0E]=DE
U 12DD, 0018,0038,D580,0A98,0000,12DE           R[3]_K[.6]              ; R[3]=6
U 12DE, 0018,0038,6580,0AA0,0000,1190           R[4]_K[.10]             ; R[4]=10(HEX)
U 1190, 0818,0039,6580,0800,0000,1251   =0      D_K[.10],CALL,J/DC0
U 1191, 0501,003C,0180,0AA8,0000,12DF           R[5]_D,D_D.LEFT,SI/ZERO : R[5]=100(HEX)
U 12DF, 0001,003C,0180,0AB0,0000,12E0           R[6]_D                  ; R[6]=200(HEX)
U 12E0, 0010,0038,0180,0908,0200,12E1           VA_RC[1]                ; VA=4CCCC000
U 12E1, 0010,0038,0180,09F0,0000,12E2           RC[0E]_LC
U 12E2, 0000,003C,0180,0900,0000,12E3           LC_RC[0]                ; RC[0]=PTE=A4155555
U 12E3, 0010,0038,0180,09E8,0000,1192           RC[0D]_LC
U 1192, 0010,0039,0180,0AC0,0000,10F0   =0      R[8]_LC,CALL,J/TBWRB    ; WRITE VA=4CCCC000 INTO BOTH GROUPS
U 1193, 0000,003C,0180,0800,0000,1194           NOP
                                ;/////////////////////////////////////////////////////////
                                ;+      SUBTEST         1
                                ; FIRST TEST THE ADDRESS PARITY LOGIC.
                                ;-
```

```
U 1194, 0000,003D,0180,0800,0000,120E    ;2790   =0      SUBTEST
U 1195, 0000,003C,0180,0800,0000,1196    ;2791           NOP
U 1196, 0000,003D,0180,0800,0000,1209    ;2792   =0      ERLOOP
U 1197, 0000,003C,4D80,3C00,0000,12E4    ;2793   TBPAR0: ID[TBER1]_D              ; THIS SHOULD CLEAR TBER1<31:8>
U 12E4, 0000,003C,4DF0,2C00,0000,12E5    ;2794           Q_ID[TBER1]              ; READ IT BACK
U 12E5, 0019,2024,49C0,0800,0000,12E6    ;2795           A[U_Q[ANDNOT]K[.FF],Q_ALU ; MASK OFF IPA ERROR BITS
U 12E6, 0003,003C,0180,09E0,0000,12E7    ;2796           RC[0C]_0
U 12E7, 0001,203C,0180,09D8,0000,12E8    ;2797           RC[0B]_Q
U 12E8, 0001,203C,0180,0800,0010,12E9    ;2798           ALU_Q,CLK.UBCC           ; SEE IF TBER1<31:8> WAS CLEAR.
U 12E9, 0000,013C,0180,0800,0000,1198    ;2799           Z?
U 1198, 0000,003D,0180,0800,0000,120A    ;2800   =0      ERROR1                   ; TBER1<31:8> NOT CLEARED BY REFERENCE.
U 1199, 0F00,003C,0180,0800,0000,12EA    ;2801           D_0
U 12EA, 0000,003C,4980,3C00,0000,12EB    ;2802           ID[TBER0]_D              ; CLEAR TBER0<4:0>.
U 12EB, 0000,003C,49F0,2C00,0000,12EC    ;2803           Q_ID[TBER0]              ; SEE IF TBER0<4:0> WERE CLEARED
U 12EC, 0019,2034,8DC0,0800,0000,12ED    ;2804           A[U_Q[AND]K[.1F],Q_ALU
U 12ED, 0003,003C,0180,09D0,0000,12EE    ;2805           RC[0A]_0
U 12EE, 0001,203C,0180,09C8,0000,12EF    ;2806           RC[9]_Q
U 12EF, 0001,203C,0180,0800,0010,12F0    ;2807           ALU_Q,CLK.UBCC           ; SEE IF TBER0<4:0> GOT CLEARED.
U 12F0, 0000,013C,0180,0800,0000,119A    ;2808           Z?
U 119A, 0000,003D,0180,0800,0000,120A    ;2809   =0      ERROR1                   ; CAN WRITE (OR READ) 0'S IN TBER0<4:0>.
U 119B, 0800,003C,0180,0A20,0000,12F1    ;2810   TBPAR1: D_R[4]
U 12F1, 0819,0014,0580,0800,0000,12F2    ;2811           D_D+K[.1]
U 12F2, 0000,003C,4980,3C00,0000,12F3    ;2812           ID[TBER0]_D              ; SET MME AND MAINTENANCE BITS TO
                                         ;2813                                    ; FORCE A PARITY ERROR.
U 12F3, 0000,003C,49F0,2C00,0000,12F4    ;2814           Q_ID[TBER0]              ; SEE IF BITS GOT SET.
U 12F4, 0019,2034,8DC0,0800,0000,12F5    ;2815           A[U_Q[AND]K[.1F],Q_ALU
U 12F5, 0001,003C,0180,09D0,0000,12F6    ;2816           RC[0A]_D
U 12F6, 0001,203C,0180,09C8,0000,12F7    ;2817           RC[9]_Q
U 12F7, 001D,2000,0180,0800,0010,12F8    ;2818           ALU_Q-D,CLK.UBCC
U 12F8, 0000,013C,0180,0800,0000,119C    ;2819           Z?
U 119C, 0000,003D,0180,0800,0000,120A    ;2820   =0      ERROR1                   ; CAN'T SET BITS<4:0> (OR READ REG.) IN TBER0.
U 119D, 0000,003C,0180,0A70,0000,12F9    ;2821           LAB_R[0E]
U 12F9, 0000,003C,0180,52F8,0000,12FA    ;2822           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; THIS SHOULD TRAP BECAUSE OF TB PARITY.
U 12FA, 0800,003C,0180,0A78,0000,12FB    ;2823           D_R[0F]                  ; CHECK UTRAP FLAG FOR TRAP.
U 12FB, 0018,0038,1980,0AF8,0000,12FC    ;2824           A[U_0(K),R[0F]_ALU
U 12FC, 0001,003C,0180,09C0,0000,12FD    ;2825           RC[8]_D
U 12FD, 0000,003C,0180,0A70,0000,12FE    ;2826           LAB_R[0E]                ; SEE IF A TRAP OCCURRED.
U 12FE, 001C,2000,0180,0800,0010,12FF    ;2827           ALU_LA[A-B]D,CLK.UBCC
U 12FF, 0000,013C,0180,0800,0000,119E    ;2828           Z?
U 119E, 0000,003C,0180,0800,0000,1300    ;2829   =0      J/TBPAR2                 ; OK TRAPPED. GO SEE IF UTRAP WAS TB PARITY
U 119F, 0000,003D,0180,0800,0000,120A    ;2830           ERROR1                   ; NO TRAP OCCURRED!
U 1300, 0000,003C,5D80,0800,0084,7301    ;2831   TBPAR2: SC_K[.7]                 ; SEE IF THE TRAP WAS A TB PARITY ERROR.
U 1301, 0001,0024,0180,0800,0010,1302    ;2832           ALU_D.ANDNOT.MASK,CLK.UBCC
U 1302, 0000,013C,0180,0800,0000,11A0    ;2833           Z?
U 11A0, 0000,003D,0180,0800,0000,120A    ;2834   =0      ERROR1                   ; A TRAP WHICH WAS NOT A TB PARITY ERROR
                                         ;2835                                    ; TRAP OCCURRED WHILE FORCING TB PARITY ERRORS.
U 11A1, 0000,003C,0180,0800,0000,1303    ;2836           NOP                      ; OK
U 1303, 0800,003C,4DF0,2E28,0000,1304    ;2837           Q_ID[TBER1],D_R[5]       ; SEE IF TBER1 IS SET CORRECTLY.
U 1304, 0019,2024,49C0,0800,0000,1305    ;2838           A[U_Q[ANDNOT]K[.FF],Q_ALU ; MASK OFF IPA ERROR BITS.
U 1305, 081C,2030,0180,0A30,0000,1306    ;2839           LAB_R[6],ALU_LA[OR]D,D_ALU
U 1306, 0001,003C,0180,09E0,0000,1307    ;2840           RC[0C]_D
U 1307, 0001,203C,0180,09D8,0000,1308    ;2841           RC[0B]_Q
U 1308, 001D,2000,0180,0800,0010,1309    ;2842           ALU_Q-D,CLK.UBCC
U 1309, 0000,013C,0180,0800,0000,11A2    ;2843           Z?
U 11A2, 0000,003D,0180,0800,0000,120A    ;2844   =0      ERROR1                   ; TBER1<31:8> NOT SET CORRECTLY.
```

```
U 11A3, 0000,003C,4D80,3C00,0000,130A   ;2845            ID[TBER1]_D                ; THIS SHOULD CLEAR TBER1<31:8>
U 130A, 0000,003C,4DF0,2C00,0000,130B   ;2846            Q_ID[TBER1]                ; SEE IF TBER1<31:8> WAS CLEARED.
U 130B, 0019,2024,49C0,0800,0000,130C   ;2847            A[U_Q[ANDNOT]K[.FF],Q_ALU ; MASK OFF IPA ERROR BITS
U 130C, 0003,003C,0180,09E0,0000,130D   ;2848            RC[0C]_0
U 130D, 0001,203C,0180,09D8,0000,130E   ;2849            RC[0B]_Q
U 130E, 0001,203C,0180,0800,0010,130F   ;2850            ALU_Q,CLK.UBCC
U 130F, 0000,013C,0180,0800,0000,11A4   ;2851            Z?
U 11A4, 0000,003D,0180,0800,0000,120A   ;2852    =0      ERROR1                     ; REFERENCE TO TBER1 DIDN'T CLEAR BITS<31:8>.
U 11A5, 0F00,003C,0180,0800,0000,1310   ;2853            D_0
U 1310, 0000,003C,4980,3C00,0000,1311   ;2854            ID[TBER0]_D                ; SEE IF TBER0<4:0> CAN BE CLEARED.
U 1311, 0000,003C,49F0,2C00,0000,1312   ;2855            Q_ID[TBER0]
U 1312, 0019,2034,8DC0,0800,0000,1313   ;2856            A[U_Q[AND]K[.1F],Q_ALU
U 1313, 0003,003C,0180,09D0,0000,1314   ;2857            RC[0A]_0
U 1314, 0001,203C,0180,09C8,0000,1315   ;2858            RC[9]_Q
U 1315, 0001,203C,0180,0800,0010,1316   ;2859            ALU_Q,CLK.UBCC
U 1316, 0000,013C,0180,0800,0000,11A6   ;2860            Z?
U 11A6, 0000,003D,0180,0800,0000,120A   ;2861    =0      ERROR1                     ; CAN'T WRITE AND READ 0'S IN TBER0<4:0>.
U 11A7, 0000,003C,0180,0A20,0000,1317   ;2862            LAB_R[4]                   ; SEE IF ALL THE ADDRESS MEMORY PARITY
U 1317, 0018,0014,0980,0AA0,0000,1318   ;2863            R[4]_LA+K[.2]              ; LOGIC HAS BEEN TESTED.
U 1318, 0000,003C,0180,0A30,0000,1319   ;2864            LAB_R[6]                   ; IF NOT INCREMENT THE MAINTENANCE
U 1319, 0020,003C,0180,0AB0,0000,131A   ;2865            ALU_LA,SHF/LEFT,SI/ZERO,R[6]_SHF ; PATTERN TO BE PUT IN TBER0<4:1>
U 131A, 0000,003C,0180,0A18,0000,131B   ;2866            LAB_R[3]
U 131B, 0018,0000,0580,0A98,0010,131C   ;2867            R[3]_LA-K[.1],CLK.UBCC
U 131C, 0000,013C,0180,0800,0000,11A8   ;2868            Z?
U 11A8, 0000,003C,0180,0800,0000,119B   ;2869    =0      J/TBPAR1
U 11A9, 0000,003C,0180,0800,0000,11AA   ;2870            NOP
                                        ;2871    ;/////////////////////////////////////////////////////////////
                                        ;2872    ;+
                                        ;2873    ;       SUBTEST        2
                                        ;2874    ; NOW TEST THE DATA MEMORY PARITY LOGIC.
                                        ;2875    ;-
U 11AA, 0000,003D,0180,0800,0000,120E   ;2876    =0      SUBTEST
U 11AB, 0018,0038,D580,0A98,0000,131D   ;2877            R[3]_K[.6]                 ; R[6]=6
U 131D, 0018,0038,1180,0AA0,0000,11AC   ;2878            R[4]_K[.4]                 ; R[4]=4
U 11AC, 0000,003D,0180,0800,0000,1209   ;2879    =0      ERLOOP
U 11AD, 0000,003C,4D80,3C00,0000,131E   ;2880    TBPAR3: ID[TBER1]_D                ; THIS SHOULD CLEAR TBER1<31:8>
U 131E, 0000,003C,4DF0,2C00,0000,131F   ;2881            Q_ID[TBER1]                ; SEE IF TBER1<31:8> ARE CLEAR
U 131F, 0019,2024,49C0,0800,0000,1320   ;2882            A[U_Q[ANDNOT]K[.FF],Q_ALU ; MASK OFF THE IPA ERROR BITS
U 1320, 0003,003C,0180,09E0,0000,1321   ;2883            RC[0C]_0
U 1321, 0001,203C,0180,09D8,0000,1322   ;2884            RC[0B]_Q
U 1322, 0001,203C,0180,0800,0010,1323   ;2885            ALU_Q,CLK.UBCC             ; SEE IF TBER1<31:8> WAS CLEAR.
U 1323, 0000,013C,0180,0800,0000,11AE   ;2886            Z?
U 11AE, 0000,003D,0180,0800,0000,120A   ;2887    =0      ERROR1                     ; TBER1<31:8> NOT CLEARED BY REFERENCE.
U 11AF, 0F00,003C,0180,0800,0000,1324   ;2888            D_0
U 1324, 0000,003C,4980,3C00,0000,1325   ;2889            ID[TBER0]_D                ; CLEAR TBER0.
U 1325, 0000,003C,49F0,2C00,0000,1326   ;2890            Q_ID[TBER0]
U 1326, 0019,2034,8DC0,0800,0000,1327   ;2891            A[U_Q[AND]K[.1F],Q_ALU
U 1327, 0003,003C,0180,09D0,0000,1328   ;2892            RC[0A]_0
U 1328, 0001,203C,0180,09C8,0000,1329   ;2893            RC[9]_Q
U 1329, 0001,203C,0180,0800,0010,132A   ;2894            ALU_Q,CLK.UBCC             ; SEE IF TBER0<4:0> GOT CLEARED.
U 132A, 0000,013C,0180,0800,0000,11B0   ;2895            Z?
U 11B0, 0000,003D,0180,0800,0000,120A   ;2896    =0      ERROR1                     ; CAN WRITE (OR READ) 0'S IN TBER0<4:0>.
U 11B1, 0800,003C,0180,0A20,0000,132B   ;2897    TBPAR4: D_R[4]
U 132B, 0819,0014,0580,0800,0000,132C   ;2898            D_D+K[.1]
U 132C, 0000,003C,4980,3C00,0000,132D   ;2899            ID[TBER0]_D                ; SET MME AND MAINTENANCE BITS TO
```

```
                                            ;2900                                     ; FORCE A PARITY ERROR.
U 132D, 0000,003C,49F0,2C00,0000,132E       ;2901              Q_ID[TBER0]            ; SEE IF BITS GOT SET.
U 132E, 001°,2034,8DC0,0800,0000,132F       ;2902              ALU_Q[AND]K[.1F],Q_ALU
U 132F, 0001,003C,0180,09D0,0000,1330       ;2903              RC[0A]_D
U 1330, 0001,203C,0180,09C8,0000,1331       ;2904              RC[9]_Q
U 1331, 001D,2000,0180,0800,0010,1332       ;2905              ALU_Q-D,CLK.UBCC
U 1332, 0000,013C,0180,0800,0000,11B2       ;2906              Z?
U 11B2, 0000,003D,0180,0800,0000,120A       ;2907      =0      ERROR1                 ; CAN'T SET BITS<4:0> (OR READ REG.) IN TBER0.
U 11B3, 0000,003C,0180,0A70,0000,1333       ;2908              LAB_R[0E]
U 1333, 0000,003C,0180,52F8,0000,1334       ;2909              R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; THIS SHOULD TRAP BECAUSE OF TB PARITY ERRO
U 1334, 0800,003C,0180,0A78,0000,1335       ;2910              D_R[0F]
U 1335, 0018,0038,1980,0AF8,0000,1336       ;2911              ALU_0(K),R[0F]_ALU     ; CHECK THE UTRAP FLAG
U 1336, 0001,003C,0180,09C0,0000,1337       ;2912              RC[8]_D        ; TO SEE IF A UTRAP OCCURRED
U 1337, 0000,003C,0180,0A70,0000,1338       ;29'3              LAB_R[0E]              ; SEE IF A TRAP OCCURRED.
U 1338, 001C,2000,0180,0800,0010,1339       ;2914              ALU_LA[A-B]D,CLK.UBCC
U 1339, 0000,013C,0180,0800,0000,11B4       ;2915              Z?
U 11B4, 0000,003C,0180,0800,0000,133A       ;2916      =0      J/TBPAR5               ; OK TRAPPED.
U 11B5, 0000,003D,0180,0800,0000,120A       ;2917              ERROR1                 ; NO TRAP OCCURRED!
U 133A, 0000,003C,5D80,0800,0084,733B       ;2918      TBPAR5: SC_K[.7]               ; SEE IF THE TRAP WAS A TB PARITY ERROR.
U 133B, 0001,0024,0180,0800,0010,133C       ;2919              ALU_D.ANDNOT.MASK,CLK.UBCC
U 133C, 0000,013C,0180,0800,0000,11B6       ;2920              Z?
U 11B6, 0000,003D,0180,0800,0000,120A       ;2921      =0      ERROR1                 ; A TRAP WHICH WAS NOT A TB PARITY ERROR
                                            ;2922                                     ; TRAP OCCURRED.
U 11B7, 0000,003C,0180,0800,0000,133D       ;2923              NOP                    ; OK
U 133D, 0800,003C,4DF0,2E28,0000,133E       ;2924              Q_ID[TBER1],D_R[5]     ; SEE IF TBER1<31:8> IS SET CORRECTLY.
U 133E, 0019,2024,49C0,0800,0000,133F       ;2925              ALU_Q[ANDNOT]K[.FF],Q_ALU ; MASK OFF IPA ERROR BITS
U 133F, 081C,2030,0180,0A30,0000,1340       ;2926              LAB_R[6],ALU_LA[OR]D,D_ALU
U 1340, 0001,003C,0180,09E0,0000,1341       ;2927              RC[0C]_D
U 1341, 0001,203C,0180,09D8,0000,1342       ;2928              RC[0B]_Q
U 1342, 001D,2000,0180,0800,0010,1343       ;2929              ALU_Q-D,CLK.UBCC
U 1343, 0000,013C,0180,0800,0000,11B8       ;2930              Z?
U 11B8, 0000,003D,0180,0800,0000,120A       ;2931      =0      ERROR1                 ; TBER1<31:8> NOT SET CORRECTLY.
U 11B9, 0000,003C,4D80,3C00,0000,1344       ;2932              ID[TBER1]_D            ; SHOULD CLEAR TBER1<31:8>
U 1344, 0000,003C,4DF0,2C00,0000,1345       ;2933              Q_ID[TBER1]            ; SEE IF TBER1 WAS CLEARED.
U 1345, 0019,2024,49C0,0800,0000,1346       ;2934              ALU_Q[ANDNOT]K[.FF],Q_ALU
U 1346, 0003,003C,0180,09E0,0000,1347       ;2935              RC[0C]_0
U 1347, 0001,203C,0180,09D8,0000,1348       ;2936              RC[0B]_Q
U 1348, 0001,203C,0180,0800,0010,1349       ;2937              ALU_Q,CLK.UBCC
U 1349, 0000,013C,0180,0800,0000,11BA       ;2938              Z?
U 11BA, 0000,003D,0180,0800,0000,120A       ;2939      =0      ERROR1                 ; REFERENCE TO TBER1 DIDN'T CLEAR BITS<31:8>
U 11BB, 0F00,003C,0180,0800,0000,134A       ;2940              D_0
U 134A, 0000,003C,4980,3C00,0000,134B       ;2941              ID[TBER0]_D            ; SEE IF TBER0<4:0> CAN BE CLEARED.
U 134B, 0000,003C,49F0,2C00,0000,134C       ;2942              Q_ID[TBER0]
U 134C, 0019,2034,8DC0,0800,0000,134D       ;2943              ALU_Q[AND]K[.1F],Q_ALU
U 134D, 0003,003C,0180,09D0,0000,134E       ;2944              RC[0A]_0
U 134E, 0001,203C,0180,09C8,0000,134F       ;2945              RC[9]_Q
U 134F, 0001,203C,0180,0800,0010,1350       ;2946              ALU_Q,CLK.UBCC
U 1350, 0000,013C,0180,0800,0000,11BC       ;2947              Z?
U 11BC, 0000,003D,0180,0800,0000,120A       ;2948      =0      ERROR1                 ; CAN'T WRITE AND READ 0'S IN TBER0<4:0>.
U 11BD, 0000,003C,0180,0A20,0000,1351       ;2949              LAB_R[4]               ; HAVE ALL THE TB DATA PARITY CHECKERS
U 1351, 0018,0014,0980,0AA0,0000,1352       ;2950              R[4]_LA+K[.2]          ; BEEN TESTED?
U 1352, 0000,003C,0180,0A30,0000,1353       ;2951              LAB_R[6]               ; IF NOT THEN INCREMENT THE
U 1353, 0020,003C,0180,0AB0,0000,1354       ;2952              ALU_LA,SHF/LEFT,SI/ZERO,R[6]_SHF ; PATTERN USED IN THE MAINTENANCE
U 1354, 0000,003C,0180,0A18,0000,1355       ;2953              LAB_R[3]               ; REGISTER AND CONTINUE
U 1355, 0018,0000,0580,0A98,0010,1356       ;2954              R[3]_LA-K[.1],CLK.UBCC
```

```
U 1356, 0000,013C,0180,0800,0000,11BE   ;2955            Z?
U 11BE, 0000,003C,0180,0800,0000,11AD   ;2956   =0       J/TBPAR3
U 11BF, 0000,003C,0180,0800,0000,1357   ;2957            NOP
                                        ;2958   ;////////////////////////////////////////////////////////////////
                                        ;2959   ; MAKE SURE THAT NIETHER GROUP WAS WRITTEN DURING THE ABOVE TEST.
U 1357, 0818,0038,0580,0800,0000,1358   ;2960            D_K[.1]
U 1358, 0000,003C,4980,3C00,0000,1359   ;2961            ID[TBER0]_D              ; TURN ON MME
U 1359, 0000,003C,0180,0908,0000,135A   ;2962            LC_RC[1]                 ; VA=4CCCC000
U 135A, 0010,0038,0180,09D0,0000,135B   ;2963            RC[0A]_LC
U 135B, 0000,003C,0180,0910,0000,10B8   ;2964            LC_RC[2]
U 10B8, 0010,0039,0180,0AB8,0000,123F   ;2965   =000     R[7]_LC,CALL,J/HIT0      ; CHECK FOR HIT IN GROUP 0
U 10B9, 0000,003D,0180,0800,0000,120A   ;2966            ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 10BA, 0000,003D,0180,0800,0000,120A   ;2967            ERROR1          ; A TB MISS UTRAP OCCURRED
U 10BB, 0000,003D,0180,0800,0000,120A   ;2968            ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 10BC, 0000,003D,0180,0800,0000,1223   ;2969            CALL,J/RELCHK            ; CHECK THE RELOCATED ADDRESS
U 10BD, 0000,003D,0180,0800,0000,120A   ;2970            ERROR1          ; A UTRAP OCCURRED
U 10BE, 0000,003D,0180,0800,0000,120A   ;2971            ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 10BF, 0000,003C,0180,0800,0000,10C0   ;2972            NOP
U 10C0, 0000,003D,0180,0800,0000,124C   ;2973   =000     CALL,J/HIT1              ; CHECK FOR A HIT IN GROUP 1
U 10C1, 0000,003D,0180,0800,0000,120A   ;2974            ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 10C2, 0000,003D,0180,0800,0000,120A   ;2975            ERROR1          ; A TB MISS UTRAP OCCURRED
U 10C3, 0000,003D,0180,0800,0000,120A   ;2976            ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 10C4, 0000,003C,0180,0800,0000,11C0   ;2977            NOP
                                        ;2978   =
                                          .PAGE   "TEST AA        MODIFY BIT UTRAP TEST"
                                     ;*******************************************************************
                                     ;++
                                     ; TEST  AA      MODIFY BIT UTRAP TEST
                                     ;
                                     ; TEST DESCRIPTION
                                     ;        THIS IS A TEST OF THE MODIFY BIT TRAPS IN BOTH GROUPS. A
                                     ;        REFERENCE IS MADE TO A TB HIT ADDRESS CONATINING A PTE
                                     ;        WITH THE M BIT CLEAR. THIS SHOULD RESULT IN A UTRAP.
                                     ;
                                     ; ERROR DESCRIPTION
                                     ;        EXPECTED TBER0 (IF CHECKING HIT/MISS BITS)
                                     ;                OR GOT TBER1 (IF UNEXPECTED UTRAP OCCURRED)
                                     ;        ACTUAL TBER0
                                     ;        EXPECTED TIME OUT ADDRESS REGISTER
                                     ;        ACTUAL TIME OUT ADDRESS REGISTER
                                     ;        VA WRITTEN
                                     ;        UTRAP FLAG (IF UNEXPECTED UTRAP OCCURS)
                                     ;                FLAG            UTRAP TYPE
                                     ;                ----            ----------
                                     ;                DE              NO UTRAP OCCURRED
                                     ;                5E              TB PARITY ERROR
                                     ;                9E              TB MISS
                                     ;                CE              TB PROTECTION ERROR
                                     ;                D6              TB MODIFY BIT ERROR
                                     ;                DA              X PAGE UTRAP
                                     ;                DC              UNALIGNED DATA UTRAP
                                     ;
                                     ;--
                                     ;*******************************************************************
                                     =0
U 11C0, 0000,003D,0180,0800,0000,11F2 TBMB:   NEWTST
U 11C1, 0018,0038,D580,09F8,0000,11C2         RC[0F]_K[.6]
U 11C2, 0000,003D,0180,0800,0000,1213 =0      CALL,J/CSOFF              ; TURN OFF THE CACHE AND SBI CYCLES
U 11C3, 0000,003C,0180,0800,0000,11C4         NOP
U 11C4, 0000,003D,0180,0800,0000,1269 =0      CALL,J/TBWPTP             ; GENERATE SOME TEST DATA PATTERNS
U 11C5, 0F00,003C,0180,0800,0000,11C6         D_0
U 11C6, 0000,003D,0180,0800,0000,105C =0      CALL,J/DC.DE
U 11C7, 0001,003C,0180,0AF0,0000,135C         R[0E]_D                   ; SET UP THE UTRAP FLAG, R[0E]=DE
                                     ;///////////////////////////////////////////////,///////////
                                     ;+
                                     ;        SUBTEST         1
                                     ; FIRST PERFORM TEST IN GROUP 0.
                                     ;-
U 135C, 0010,0038,0180,0908,0200,135D         VA_RC[1]                  ; VA=4CCCC000
U 135D, 0000,003C,0180,0900,0000,11C8         LC_RC[0]                  ; RC[0]=PTE=A4155555
U 11C8, 0010,0039,0180,0AC0,0000,10F0 =0      R[8]_LC,CALL,J/TBWRB      ; WRITE VA=4CCCC000 INTO BOTH GROUPS
U 11C9, 0010,0038,0180,0920,0200,135E         VA_RC[4]                  ; VA=55554000
U 135E, 0010,0038,0180,09D0,0000,135F         RC[0A]_LC
U 135F, 0810,0038,0180,0918,0000,1360         D_RC[3]                   ; PTE=A0199999
U 1360, 0000,003C,E580,0800,0084,71CA         SC_K[.1A]                 ; WRITE THIS PTE AT VA=55554000 INTO GROUP 0
U 11CA, 0001,0035,0180,0AC0,0000,10EE =0      ALU_D.AND.MASK,R[8]_ALU,CALL,J/TBWR0 ; WRITE PTE WITH M BIT=0.
U 11CB, 0000,003C,0180,0800,0000,11CC         NOP
U 11CC, 0000,003D,0180,0800,0000,1209 =0      ERLOOP
U 11CD, 0000,003C,0180,0A70,0000,1361         LAB_R[0E]                 ; SET UP UTRAP FLAG
```

```
U 1361, 0000,003C,0180,52F8,0000,1362             R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; THIS SHOULD TRAP BECAUSE OF M BIT.
U 1362, 0800,003C,0180,0A78,0000,1363             D_R[0F]                 ; SEE IF TRAP OCCURRED
U 1363, 0018,0038,1980,0AF8,0000,1364             A[U_0(K),R[0F]_ALU
U 1364, 0001,003C,0180,09C8,0000,1365             RC[9]_D
U 1365, 0000,003C,0180,0A70,0000,1366             LAB_R[0E]
U 1366, 001C,2000,0180,0800,0010,1367             ALU_LA[A-B]D,CLK.UBCC   ; SEE IF A UTRAP OCCURRED.
U 1367, 0000,013C,0180,0800,0000,11CE             Z?
U 11CE, 0000,003C,0180,0800,0000,1368     =0      J/TBMB1
U 11CF, 0000,003D,0180,0800,0000,120A             ERROR1                  ; DIDN'T TRAP WITH M BIT CLEAR
U 1368, 0000,003C,0D80,0800,0084,7369     TBMB1:  SC_K[.3]                ; SEE IF THE TRAP WAS AN M BIT TRAP.
U 1369, 0001,0024,0180,0800,0010,136A             ALU_D.ANDNOT.MASK,CLK.UBCC
U 136A, 0000,013C,0180,0800,0000,11D0             Z?
U 11D0, 0000,003D,0180,0800,0000,120A     =0      ERROR1                  ; THE TRAP WAS NOT AN M BIT TRAP.
U 11D1, 0000,003C,0180,1000,0000,136B             FS/MCT,MCT/TEST.WCHK    ; CHECK BRANCH TB.TEST
U 136B, 0000,1D3C,0180,0800,0000,101C             BEN/TB.TEST
U 101C, 0000,003D,0180,0800,0000,120A     =11100  ERROR1                  ; BEN/TB.TEST FAILED AFTER AN M BIT ERROR
U 101D, 0000,003C,0180,0800,0000,136C             J/TBMB15
U 101E, 0000,003D,0180,0800,0000,120A             ERROR1
U 101F, 0000,003D,0180,0800,0000,120A             ERROR1
U 136C, 0000,003C,0180,0800,0000,136D     TBMB15: NOP
                                          ; MAKE SURE GROUP 1 IS INTACT.
U 136D, 0010,0038,0180,0908,0200,136E             VA_RC[1]                ; VA=4CCCC000
U 136E, 0010,0038,0180,09D0,0000,136F             RC[0A]_LC
U 136F, 0000,003C,0180,0910,0000,10C8             LC_RC[2]
U 10C8, 0010,0039,0180,0AB8,0000,124C     =000    R[7]_LC,CALL,J/HIT1     ; CHECK FOR A HIT IN GROUP 1
U 10C9, 0000,003D,0180,0800,0000,120A             ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 10CA, 0000,003D,0180,0800,0000,120A             ERROR1          ; A TB MISS UTRAP OCCURRED
U 10CB, 0000,003D,0180,0800,0000,120A             ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 10CC, 0000,003D,0180,0800,0000,1223             CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 10CD, 0000,003D,0180,0800,0000,120A             ERROR1          ; A UTRAP OCCURRED
U 10CE, 0000,003D,0180,0800,0000,120A             ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 10CF, 0000,003C,0180,1000,0000,1370             FS/MCT,MCT/TEST.WCHK    ; CHECK THE BRANCH TB.TEST WITH NO ERRORS
U 1370, 0000,1D3C,0180,0800,0000,103C             BEN/TB.TEST
U 103C, 0000,003C,0180,0800,0000,1371     =11100  J/TBMB16
U 103D, 0000,003D,0180,0800,0000,120A             ERROR1                  ; BRANCH TB.TEST FAILED WITH NO ERRORS
U 103E, 0000,003D,0180,0800,0000,120A             ERROR1
U 103F, 0000,003D,0180,0800,0000,120A             ERROR1
U 1371, 0000,003C,0180,0800,0000,11D2     TBMB16: NOP
                                          ;//////////////////////////////////////////////////////////
                                          ;+
                                          ;       SUBTEST         2
                                          ; NOW TEST GROUP 1.
                                          ;-
U 11D2, 0000,003D,0180,0800,0000,120E     =0      SUBTEST
U 11D3, 0000,003C,0180,0800,0000,11D4             NOP
U 11D4, 0000,003D,0180,0800,0000,1209     =0      ERLOOP
U 11D5, 0010,0038,0180,0938,0200,1372             VA_RC[7]                ; VA=33330000
U 1372, 0010,0038,0180,09D0,0000,1373             RC[0A]_LC
U 1373, 0000,003C,0180,0930,0000,11D6             LC_RC[6]                ; RC[6]=PTE=A40AAAAA
U 11D6, 0010,0039,0180,0AC0,0000,10F0     =0      R[8]_LC,CALL,J/TBWRB    ; WRITE VA=33330000 INTO BOTH GROUPS
U 11D7, 0000,003C,0180,0A08,0200,1374             VA_R[1]                 ; VA=2AAA8000
U 1374, 0800,003C,0180,0A00,0000,1375             D_R[0]                  ; PTE=A0066666
U 1375, 0000,003C,E580,0800,0084,71D8             SC_K[.1A]               ; WRITE THIS INTO GROUP 0
U 11D8, 0001,0035,0180,0AC0,0000,10E8     =0      ALU_D.AND.MASK,R[8]_ALU,CALL,J/TBWR1 ; WRITE PTE WITH M BIT=0.
U 11D9, 0000,003C,0180,0A70,0000,1376             LAB_R[0E]               ; SET UTRAP FLAG
```

```
U 1376, 0000,003C,0180,52F8,0000,1377   ;3089           R[OF]_LA,FS/MCT,MCT/READ.V.WCHK ; THIS SHOULD TRAP BECAUSE OF M BIT.
U 1377, 0800,003C,0180,0A78,0000,1378   ;3090           D_R[OF]                 ; SEE IF A UTRAP UCCURRED
U 1378, 0018,0038,1980,0AF8,0000,1379   ;3091           ALU_0(K),R[OF]_ALU
U 1379, 0001,003C,0180,09C8,0000,137A   ;3092           RC[9]_D
U 137A, 0000,003C,0180,0A70,0000,137B   ;3093           LAB_R[0E]
U 137B, 001C,2000,0180,0800,0010,137C   ;3094           ALU_LA[A-B]D,CLK.UBCC   ; SEE IF A UTRAP OCCURRED.
U 137C, 0000,013C,0180,0800,0000,11DA   ;3095           Z?
U 11DA, 0000,003C,0180,0800,0000,137D   ;3096   =0      J/TBMB2
U 11DB, 0000,003D,0180,0800,0000,120A   ;3097           ERROR1                  ; DIDN'T TRAP.
U 137D, 0000,003C,0D80,0800,0084,737E   ;3098   TBMB2:  SC_K[.3]                ; SEE IF THE TRAP WAS AN M BIT TRAP.
U 137E, 0001,0024,0180,0800,0010,137F   ;3099           ALU_D.ANDNOT.MASK,CLK.UBCC
U 137F, 0000,013C,0180,0800,0000,11DC   ;3100           Z?
U 11DC, 0000,003D,0180,0800,0000,120A   ;3101   =0      ERROR1                  ; THE TRAP WAS NOT AN M BIT TRAP.
U 11DD, 0000,003C,0180,1000,0000,1380   ;3102           FS/MCT,MCT/TEST.WCHK    ; CHECK BRANCH TB.TEST AFTER AN MBIT
U 1380, 0000,1D3C,0180,0800,0000,107C   ;3103           BEN/TB.TEST             ; ERROR.
U 107C, 0000,003D,0180,0800,0000,120A   ;3104   =11100  ERROR1                  ; BRANCH TB.TEST FAILED AFTER AN MBIT ERROR
U 107D, 0000,003C,0180,0800,0000,1381   ;3105           J/TBMB25
U 107E, 0000,003D,0180,0800,0000,120A   ;3106           ERROR1
U 107F, 0000,003D,0180,0800,0000,120A   ;3107           ERROR1
U 1381, 0000,003C,0180,0800,0000,1382   ;3108   TBMB25: NOP
                                        ;3109   ; MAKE SURE GROUP 0 IS INTACT.
U 1382, 0010,0038,0180,0938,0200,1383   ;3110           VA_RC[7]                ; VA=33330000
U 1383, 0010,0038,0180,09D0,0000,1384   ;3111           RC[0A]_LC
U 1384, 0000,003C,0180,0940,0000,10D0   ;3112           LC_RC[8]
U 10D0, 0010,0039,0180,0AB8,0000,123F   ;3113   =000    R[7]_LC,CALL,J/HIT0     ; CHECK FOR HIT IN GROUP 0
U 10D1, 0000,003D,0180,0800,0000,120A   ;3114           ERROR1          ; A NON TB MISS UTRAP OCCURRED
U 10D2, 0000,003D,0180,0800,0000,120A   ;3115           ERROR1          ; A TB MISS UTRAP OCCURRED
U 10D3, 0000,003D,0180,0800,0000,120A   ;3116           ERROR1          ; NO UTRAP OCCURRED BUT HIT/MISS BITS INCORRECT
U 10D4, 0000,003D,0180,0800,0000,1223   ;3117           CALL,J/RELCHK           ; CHECK THE RELOCATED ADDRESS
U 10D5, 0000,003D,0180,0800,0000,120A   ;3118           ERROR1          ; A UTRAP OCCURRED
U 10D6, 0000,003D,0180,0800,0000,120A   ;3119           ERROR1          ; NO UTRAP BUT RELOCATED ADDRESS INCORRECT
U 10D7, 0000,003C,0180,1000,0000,1385   ;3120           FS/MCT,MCT/TEST.WCHK    ; CHECK BRANCH TB.TEST AFTER
U 1385, 0000,1D3C,0180,0800,0000,109C   ;3121           BEN/TB.TEST             ; A REFERENCE WITH NO ERROR
U 109C, 0000,003C,0180,0800,0000,1386   ;3122   =11100  J/TBMB26
U 109D, 0000,003D,0180,0800,0000,120A   ;3123           ERROR1                  ; BRANCH TB.TEST FAILED AFTER A
U 109E, 0000,003D,0180,0800,0000,120A   ;3124           ERROR1                  ; REFERENCE WITH NO ERROR.
U 109F, 0000,003D,0180,0800,0000,120A   ;3125           ERROR1
U 1386, 0000,003C,0180,0800,0000,11DE   ;3126   TBMB26: NOP
```

```
                                          ;3127          .PAGE   "TEST AB        TB VALID BIT UTRAP TEST"
                                          ;3128   ;*******************************************************************
                                          ;3129   ;++
                                          ;3130   ; TEST  AB      TB VALID BIT UTRAP TEST
                                          ;3131   ;
                                          ;3132   ; TEST DESCRIPTION
                                          ;3133   ;      THIS IS A TEST OF THE VALID BIT INPUTS TO THE TB MEMORIES
                                          ;3134   ;      AND THE OUTPUT OF EACH GROUP'S VALID BIT TO THE TB HIT
                                          ;3135   ;      COMPARATORS. A PTE IS MADE A HIT IN EACH GROUP WHICH
                                          ;3136   ;      HAS THE VALID BIT DEASSERTED. THESE PTE'S SHOULD RESULT IN
                                          ;3137   ;      TB MISS TRAPS WHEN A REFERNECE IS MADE WHICH INDEXES TO
                                          ;3138   ;      THEM.
                                          ;3139   ;
                                          ;3140   ; ERROR DESCRIPTION
                                          ;3141   ;      EXPECTED TBERO
                                          ;3142   ;      ACTUAL TBERO (HIT/MISS BITS RELEVANT)
                                          ;3143   ;      EXPECTED TIME OUT ADDRESS REGISTER
                                          ;3144   ;      GOT TIME OUT ADDRESS REGISTER
                                          ;3145   ;      VA WRITTEN
                                          ;3146   ;      UTRAP FLAG
                                          ;3147   ;              FLAG            UTRAP TYPE
                                          ;3148   ;              ----            ----------
                                          ;3149   ;              DE              NO UTRAP OCCURRED
                                          ;3150   ;              5E              TB PARITY ERROR
                                          ;3151   ;              9E              TB MISS
                                          ;3152   ;              CE              TB PROTECTION ERROR
                                          ;3153   ;              D6              TB MODIFY BIT ERROR
                                          ;3154   ;              DA              X PAGE UTRAP
                                          ;3155   ;              DC              UNALIGNED DATA UTRAP
                                          ;3156   ;
                                          ;3157   ;--
                                          ;3158   ;*******************************************************************
                                          ;3159   =0
U 11DE, 0000,003D,0180,0800,0000,11F2     ;3160   TBVAL:  NEWTST
U 11DF, 0018,0038,D580,09F8,0000,11E0     ;3161           RC[OF]_K[.6]
U 11E0, 0000,003D,0180,0800,0000,1213     ;3162   =0      CALL,J7CSOFF              ; TURN OFF THE CACHE AND SBI CYCLES
U 11E1, 0F00,003C,0180,0800,0000,11E2     ;3163           D_0
U 11E2, 0000,003D,0180,0800,0000,105C     ;3164   =0      CALL,J/DC.DE
U 11E3, 0001,003C,0180,0AF0,0000,11E4     ;3165           R[0E]_D                   ; SET UP THE UTRAP FLAG, R[0E]=DE
U 11E4, 0000,003D,0180,0800,0000,1269     ;3166   =0      CALL,J/TBWPTP             ; GENERATE SOME TEST DATA PATTERNS
U 11E5, 0000,003C,8D80,0800,0084,7387     ;3167           SC_K[.1F]                 ; WRITE VA=4CCCC000
U 1387, 0810,0038,0180,0900,0000,1388     ;3168           D_RC[0]                   ; WITH PTE=24155555
U 1388, 0001,0034,0180,0AC0,0000,11E6     ;3169           A[U_D.AND.MASK,R[8]_ALU ; INTO GROUP 0
U 11E6, 0010,0039,0180,0908,0200,10F0     ;3170   =0      VA_RC[1],CALL,J/TBWRB
U 11E7, 0810,0038,0180,0918,0000,1389     ;3171           D_RC[3]                   ; WRITE VA=55554000
U 1389, 0001,0034,0180,0AC0,0000,11E8     ;3172           A[U_D.AND.MASK,R[8]_ALU ; WITH PTE=24199999
U 11E8, 0010,0039,0180,0920,0200,10E8     ;3173   =0      VA_RC[4],CALL,J/TBWR1     ; INTO GROUP 1
U 11E9, 0010,0038,0180,0908,0200,10E0     ;3174           VA_RC[1]                  ; VA=4CCCC000
U 10E0, 0010,0039,0180,09D0,0000,1234     ;3175   =00     RC[0A]_LC,CALL,J/MISS     ; CHECK FOR MISS AT VA=4CCCC000
U 10E1, 0000,003D,0180,0800,0000,120A     ;3176           ERROR1           ; NO UTRAP OCCURRED (EXPECTED TB MISS)
U 10E2, 0000,003D,0180,0800,0000,120A     ;3177           ERROR1           ; UTRAPPED BUT NOT BECAUSE OF TB MISS
U 10E3, 0010,0038,0180,0920,0200,10E4     ;3178           VA_RC[4]                  ; VA=55554000
                                          ;3179   =
U 10E4, 0010,0039,0180,09D0,0000,1234     ;3180   =00     RC[0A]_LC,CALL,J/MISS     ; CHECK FOR MISS AT VA=55554000
U 10E5, 0000,003D,0180,0800,0000,120A     ;3181           ERROR1           ; NO UTRAP OCCURRED (EXPECTED TB MISS)
```

```
U 10E6, 0000,003D,0180,0800,0000,120A   ;3182           ERROR1          ; UTRAPPED BUT NOT BECAUSE OF TB MISS
U 10E7, 0000,003C,0180,0800,0000,138A   ;3183           NOP
                                        ;3184
U 138A, 0000,003C,0180,0800,0000,11EA   ;3185           NOP
                                        ;3186   =0
U 11EA, 0000,003D,0180,0800,0000,11F2   ;3187   DUMMY1: NEWTST
```

```
;                           Location / Line Number Index

;Location         0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000           1871:    1838     1845=    1861=    2456=    2457=    2458=    2459=
U 1008           2285=    2286=    2287=    2288=    2289=    2290=    2291=    2292=
U 1010           2301=    2302=    2303=    2304=    2305=    2306=    2307=    2308=
U 1018           2483=    2484=    2485=    2486=    3049=    3050=    3051=    3052=
U 1020           2313=    2314=    2315=    2316=    2317=    2318=    2319=    2320=
U 1028           2337=    2338=    2339=    2340=    2341=    2342=    2343=    2344=
U 1030           2354=    2355=    2356=    2357=    2358=    2359=    2360=    2361=
U 1038           2514=    2515=    2516=    2517=    3067=    3068=    3069=    3070=
U 1040           2366=    2367=    2368=    2369=    2370=    2371=    2372=    2373=
U 1048           2539=    2540=    2541=    2542=    1862=    1863=    1902:    1839
U 1050           2443=    2444=    2445=    2446=    2447=    2448=    2449=    2450=
U 1058           1951=    1952=    1905:    1840     1970=    1971=    1908:    1841
U 1060           2472=    2473=    2474=    2475=    2476=    2479=    2480=    2481=
U 1068           2502=    2503=    2504=    2505=    2506=    2507=    2508=    2509=
U 1070           2530=    2531=    2532=    2533=    2534=    2535=    2536=    2537=
U 1078           2637=    2638=    2639=    2640=    3104=    3105=    3106=    3107=
U 1080           2548=    2549=    2550=    2551=    2552=    2553=    2554=    2555=
U 1088           2624=    2625=    2626=    2627=    2628=    2629=    2630=    2631=
U 1090           2653=    2654=    2655=    2656=    2657=    2658=    2659=    2660=
U 1098           2662=    2663=    2664=    2665=    3122=    3123=    3124=    3125=
U 10A0           2679=    2680=    2681=    2682=    2683=    2684=    2685=    2686=
U 10A8           2705=    2706=    2707=    2708=    2709=    2710=    2711=    2712=
U 10B0           2723=    2724=    2725=    2726=    2727=    2728=    2729=    2730=
U 10B8           2965=    2966=    2967=    2968=    2969=    2970=    2971=    2972=
U 10C0           2973=    2974=    2975=    2976=    2977=    1842     1972=    1973=
U 10C8           3058=    3059=    3060=    3061=    3062=    3063=    3064=    3065=
U 10D0           3113=    3114=    3115=    3116=    3117=    3118=    3119=    3120=
U 10D8           2691=    2692=    2693=    2694=    2714=    2715=    2716=    2717=
U 10E0           3175=    3176=    3177=    3178=    3180=    3181=    3182=    3183=
U 10E8           1982=    1983=    1984=    1985=    1986=    1987=    1992=    1993=
U 10F0           1996=    1997=    2006=    2007=    2008=    2009=    2025=    2026=
U 10F8           2027=    2028=    2037=    2038=    2053=    2054=    2058=    2059=
U 1100           1825:    1826:    1827:    1828:    1829:    1830:    1831:    1832:
U 1108           1833:    1843     2075=    2076=    1834:    1835:    1836:    1837:
U 1110           2078=    2079=    2083=    2084=    2111=    2112=    2114=    2115=
U 1118           2117=    2118=    2121=    2122=    2124=    2125=    2127=    2128=
U 1120           2131=    2132=    2135=    2136=    2175=    2176=    2180=    2181=
U 1128           2183=    2184=    2185=    2186=    2190=    2191=    2193=    2194=
U 1130           2195=    2196=    2200=    2201=    2203=    2204=    2205=    2206=
U 1138           2210=    2211=    2213=    2214=    2259=    2260=    2261=    2262=
U 1140           2263=    2264=    2265=    2266=    2271=    2272=    2274=    2275=
U 1148           2282=    2284=    2299=    2300=    2324=    2325=    2327=    2328=
U 1150           2334=    2336=    2351=    2353=    1844     1928:    2376=    2377=
U 1158           2415=    2416=    2417=    2418=    2419=    2420=    2421=    2422=
U 1160           2433=    2434=    2436=    2437=    2439=    2440=    2470=    2471=
U 1168           2498=    2499=    2526=    2527=    2558=    2559=    2597=    2598=
U 1170           2599=    2600=    2601=    2602=    2603=    2604=    2614=    2615=
U 1178           2617=    2618=    2620=    2621=    2219:    2220:    2221:    2222:
U 1180           2651=    2652=    2677=    2678=    2703=    2704=    2733=    2734=
U 1188           2767=    2768=    2769=    2770=    2771=    2772=    2773=    2774=
U 1190           2777=    2778=    2784=    2785=    2790=    2791=    2792=    2793=
U 1198           2800=    2801=    2809=    2810=    2820=    2821=    2829=    2830=
;Location       0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0          2834=   2836=   2844=   2845=   2852=   2853=   2861=   2862=
U 11A8          2869=   2870=   2876=   2877=   2879=   2880=   2887=   2888=
U 11B0          2896=   2897=   2907=   2908=   2916=   2917=   2921=   2923=
U 11B8          2931=   2932=   2939=   2940=   2948=   2949=   2956=   2957=
U 11C0          3010=   3011=   3012=   3013=   3014=   3015=   3016=   3017=
U 11C8          3025=   3026=   3030=   3031=   3032=   3033=   3041=   3042=
U 11D0          3046=   3047=   3077=   3078=   3079=   3080=   3083=   3084=
U 11D8          3087=   3088=   3096=   3097=   3101=   3102=   3160=   3161=
U 11E0          3162=   3163=   3164=   3165=   3166=   3167=   3170=   3171=
U 11E8          3173=   3174=   3187=   1864    1865    1866    1867    1868
U 11F0          1869    1870    1880    1881    1882    1883    1884    1885
U 11F8          1886    1887    1888    1889    2223:   2224:   2225:   2226:
U 1200          1890    1891    1892    1893    1894    1895    1896    1897
U 1208          1898    1899    1900    1901    1903    1904    1936    1937
U 1210          1943    1944    1945    1950    1953    1954    1957    1958
U 1218          1959    1960    1963    1964    1965    1988    1989    1999
U 1220          2010    2011    2012    2018    2019    2020    2021    2022
U 1228          2023    2024    2029    2030    2031    2032    2033    2034
U 1230          2035    2036    2039    2040    2045    2046    2047    2048
U 1238          2049    2050    2051    2052    2055    2056    2057    2066
U 1240          2067    2068    2069    2070    2071    2072    2073    2074
U 1248          2077    2080    2081    2082    2086    2088    2089    2090
U 1250          2091    2092    2093    2094    2095    2096    2097    2098
U 1258          2099    2100    2101    2102    2103    2104    2105    2106
U 1260          2107    2108    2109    2113    2119    2123    2129    2133
U 1268          2137    2163    2164    2165    2166    2167    2168    2169
U 1270          2170    2171    2172    2173    2174    2177    2178    2179
U 1278          2182    2187    2188    2189    2192    2197    2198    2199
U 1280          2202    2207    2208    2209    2212    2218    2267    2273
U 1288          2276    2277    2278    2279    2280    2281    2293    2294
U 1290          2295    2296    2297    2298    2310    2311    2312    2326
U 1298          2329    2330    2331    2332    2333    2345    2346    2347
U 12A0          2348    2349    2350    2363    2364    2365    2374    2375
U 12A8          2423    2435    1929:   2438    2451    2452    2453    2454
U 12B0          2455    2467    2468    2469    2482    2495    2496    2497
U 12B8          2510    2511    2512    2513    2525    2538    2545    2546
U 12C0          2547    2556    2557    2605    2616    2619    2632    2633
U 12C8          2634    2635    2636    2648    2649    2650    2661    2674
U 12D0          2675    2676    2687    2688    2689    2690    2702    2713
U 12D8          2720    2721    2722    2731    2732    2775    2776    2779
U 12E0          2780    2781    2782    2783    2794    2795    2796    2797
U 12E8          2798    2799    2802    2803    2804    2805    2806    2807
U 12F0          2808    2811    2812    2814    2815    2816    2817    2818
U 12F8          2819    2822    2823    2824    2825    2826    2827    2828
U 1300          2831    2832    2833    2837    2838    2839    2840    2841
U 1308          2842    2843    2846    2847    2848    2849    2850    2851
U 1310          2854    2855    2856    2857    2858    2859    2860    2863
U 1318          2864    2865    2866    2867    2868    2878    2881    2882
U 1320          2883    2884    2885    2886    2889    2890    2891    2892
U 1328          2893    2894    2895    2898    2899    2901    2902    2903
U 1330          2904    2905    2906    2909    2910    2911    2912    2913
U 1338          2914    2915    2918    2919    2920    2924    2925    2926
U 1340          2927    2928    2929    2930    2933    2934    2935    2936
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348           2937    2938    2941    2942    2943    2944    2945    2946
U 1350           2947    2950    2951    2952    2953    2954    2955    2960
U 1358           2961    2962    2963    2964    3023    3024    3027    3028
U 1360           3029    3034    3035    3036    3037    3038    3039    3040
U 1368           3043    3044    3045    3048    3053    3055    3056    3057
U 1370           3066    3071    3081    3082    3085    3086    3089    3090
U 1378           3091    3092    3093    3094    3095    3098    3099    3100
U 1380           3103    3108    3110    3111    3112    3121    3126    3168
U 1388           3169    3172    3185
U 1390 - 13EF Unused
U 13F0           1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8           1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
          Words not
          in bounds
 ESK00DEF        0
 ESK00MAC        0
 ESKAHMAC        0
  ESKAH28      923

Used           923
Remaining

Total microwords used in memory U: 923
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH28.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 1806  MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2227  TEST AC ALIGN UTRAP LOGIC TEST
; 2451  TEST AD CROSS PAGE UTRAP USING DT/LONG TEST
; 2545  TEST AE CROSS PAGE UTRAP USING DT/WORD TEST
; 2633  TEST AF CROSS PAGE UTRAP ENABLE TEST
; 2688  TEST B0 TB PROTECTION LOGIC TEST
; 3062  TEST B1 IPA REGISTER TEST
; 3124  TEST B2 READ.V.NEWPC, HIT IN GROUP 0, TEST
```

```
;1      .NOLIST
;1804   .LIST
;1805
```

```
                                           ;1806            .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                           ;1807    .REGION/1000,13FF
                                           ;1808    ;+
                                           ;1809    ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                           ;1810    ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                           ;1811    ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                           ;1812    ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                           ;1813    ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                           ;1814    ;
                                           ;1815    ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                           ;1816    ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                           ;1817    ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                           ;1818    ;       R[OF] AND DO A RETURN0.
                                           ;1819    ;
                                           ;1820    ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                           ;1821    ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                           ;1822    ; TO THE CONSOLE.
                                           ;1823    ;
                                           ;1824    ;-
U 1100, 0000,003C,1980,0800,0084,7003      ;1825    1100:   SC_K[ZERO],J/TRPH1      ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001      ;1826    1101:   SC_K[.1],J/TRPH0        ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001      ;1827    1102:   SC_K[.2],J/TRPH0        ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001      ;1828    1103:   SC_K[.3],J/TRPH0        ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001      ;1829    1104:   SC_K[.4],J/TRPH0        ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001      ;1830    1105:   SC_K[.6],J/TRPH0        ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001      ;1831    1106:   SC_K[.9],J/TRPH0        ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001      ;1832    1107:   SC_K[.7],J/TRPH0        ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001      ;1833    1108:   SC_K[.8],J/TRPH0        ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003      ;1834    110C:   SC_K[.C],J/TRPH1        ; RDS
U 110D, 0000,003C,8980,0800,0084,7003      ;1835    110D:   SC_K[.D],J/TRPH1        ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001      ;1836    110E:   SC_K[.10],J/TRPH0       ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003      ;1837    110F:   SC_K[.F],J/TRPH1        ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,1016      ;1838    TRPH0:  Q_ID[USTACK]
U 1016, 0C00,003C,01E0,0800,0000,101E      ;1839            Q_D,D_Q
U 101E, 0000,003C,8180,3C00,0000,1036      ;1840            ID[USTACK]_D
U 1036, 0C00,003C,01E0,0800,0000,103E      ;1841            Q_D,D_Q
U 103E, 0000,003C,01C0,0A78,0000,104F      ;1842            Q_R[OF]
U 104F, 0001,2024,0180,0800,0010,105B      ;1843            ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 105B, 0000,013C,0180,0800,0000,1002      ;1844            Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000      ;1845    =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
                                           ;1846    ;+
                                           ;1847    ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                           ;1848    ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                           ;1849    ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                           ;1850    ;
                                           ;1851    ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                           ;1852    ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                           ;1853    ;             FAULT STATUS REGISTER
                                           ;1854    ;             SBI ERROR REGISTER
                                           ;1855    ;             TIMEOUT ADDRESS REGISTER
                                           ;1856    ;             MAINTENANCE REGISTER
                                           ;1857    ;             CACHE PARITY REGISTER
                                           ;1858    ;             TB ERROR REGISTER 1
                                           ;1859    ;             TB ERROR REGISTER 0
                                           ;1860    ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,1014   ;1861   TRPH1:  RC[0D]_SC
U 1014, 0000,003D,D980,0800,0084,71E6   ;1862   =0      SETRCF[.9]
U 1015, 0000,003C,49F0,2C00,0000,105F   ;1863           Q_ID[TBER0]
U 105F, 0001,203C,4DF0,2DB0,0000,1109   ;1864           RC[6]_Q,Q_ID[TBER1]
U 1109, 0001,203C,65F0,2DB8,0000,1154   ;1865           RC[7]_Q,Q_ID[SBI.ERR]
U 1154, 0001,203C,6DF0,2DD8,0000,11C8   ;1866           RC[0B]_Q,Q_ID[FAULT]
U 11C8, 0001,203C,75F0,2DE0,0000,11C9   ;1867           RC[0C]_Q,Q_ID[MAINT]
U 11C9, 0001,203C,79F0,2DC8,0000,11CA   ;1868           RC[9]_Q,Q_ID[PARITY]
U 11CA, 0001,203C,69F0,2DC0,0000,11CB   ;1869           RC[8]_Q,Q_ID[TIME.ADDR]
U 11CB, 0001,203C,81F0,2DD0,0000,1000   ;1870           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,11E0   ;1871   1000:   RC[0E]_Q,ERROR1
                                        ;1872   ;+
                                        ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1875   ;                 NEWTST
                                        ;1876   ;                 ERLOOP
                                        ;1877   ;                 ERROR1
                                        ;1878   ;                 ERROR2
                                        ;1879   ;
U 11CC, 0000,003C,65F8,0800,0084,71CD   ;1880   SCOPE:  SC_K[.10],Q_0                  ; SETUP TO WRITE IPL OF 1F
U 11CD, 0818,0038,8D80,0800,0000,11CE   ;1881           D_K[.1F]                       ; ...
U 11CE, 0D00,003C,0180,0800,0000,11CF   ;1882           D_DAL.SC
U 11CF, 0000,003C,3D80,3C00,0000,11D0   ;1883           ID[PSL]_D                      ; WRITE THE PSL
U 11D0, 0818,0038,0580,0800,0000,11D1   ;1884           D_K[.1]                        ; SETUP TO CLEAR THE CES REGISTER
U 11D1, 0D00,003C,0180,0800,0000,11D2   ;1885           D_DAL.SC
U 11D2, 0F00,003C,3180,3C00,0000,11D3   ;1886           ID[CES]_D,D_0                  ; CLEAR THE CES REGISTER
U 11D3, 0000,003C,5D80,3C00,0000,11D4   ;1887           ID[ACC.CS]_D                   ; SHUT OFF THE FLOATING POINT
U 11D4, 0000,003C,3980,3C00,0000,11D5   ;1888           ID[SIR]_D                      ; CLEAR THE SIR REGISTER
U 11D5, 0000,003C,2980,3C00,0000,11D6   ;1889           ID[CLK.CS]_D                   ; STOP INTERVAL TIMER
U 11D6, 0000,003C,4980,3C00,0000,11D7   ;1890           ID[TBER0]_D                    ; SHUT OFF THE TB
U 11D7, 0818,0038,C180,0800,0000,11D8   ;1891           D_K[.FFFF]
U 11D8, 0000,003C,6580,3C00,0000,11D9   ;1892           ID[SBI.ERR]_D
U 11D9, 0F00,003C,6D80,3C00,0000,11DA   ;1893           ID[FAULT]_D,D_0
U 11DA, 0000,003C,6D80,3C00,0000,11DB   ;1894           ID[FAULT]_D
U 11DB, 0000,003C,6580,3C00,0000,11DC   ;1895           ID[SBI.ERR]_D
U 11DC, 0003,003C,0180,09F0,0000,11DD   ;1896           RC[0E]_0
U 11DD, 0003,003C,0180,0AF8,0000,11DE   ;1897           R[0F]_0
U 11DE, 0003,003C,0180,09E8,0000,105E   ;1898           RC[0D]_0,J/CALLCON             ; CALL THE CONSOLE
U 11DF, 0818,0038,0980,0800,0000,105E   ;1899   ERLOOP: D_K[.2],J/CALLCON              ; ERRLOOP CALL
U 11E0, 0810,0038,0180,0978,0000,11E1   ;1900   ERROR1: D_RC[0F]
U 11E1, 0819,0034,4D80,0800,0000,104E   ;1901           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1902   104E:   D_D.OR.K[.4],J/CALLCON
U 11E2, 0810,0038,0180,0978,0000,11E3   ;1903   ERROR2: D_RC[0F]
U 11E3, 0819,0034,4D80,0800,0000,105A   ;1904           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1905   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1906   105E:
                                        ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1908           ID[TXDB]_D,J/CALLCON           ; CALL THE CONSOLE
                                        ;1909   ;+
                                        ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1912   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1913   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1914   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1915   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,11E4   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 11E4, 0810,0038,4D80,0978,0000,11E5   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 11E5, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 11E6, 0010,0038,01C0,0978,0000,11E7   ;1943   SETRCF: Q_RC[OF]
U 11E7, 0019,2034,4DC0,0800,0000,11E8   ;1944           Q_Q.AND.K[.FF00]
U 11E8, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946   ; THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
                                        ;1947   ; AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
                                        ;1948   ; UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
                                        ;1949   ; ARE LOST.
U 11E9, 0F18,0038,C1F8,0800,0000,101C   ;1950   CSOFF:  D_0,Q_0,ALU_K[.FFFF]
U 101C, 0500,003D,0380,0800,0000,1234   ;1951   =0      D_D.LEFT,SI77,CALL,J/DC9
U 101D, 0000,003C,8580,0800,0084,71EA   ;1952           SC_K[.C]
U 11EA, 0D00,003C,0180,0800,0000,11EB   ;1953           D_DAL.SC
U 11EB, 0000,003E,7580,3C00,0000,0001   ;1954           ID[MAINT]_D,RETURN1
                                        ;1955   ; THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
                                        ;1956   ; BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.
U 11EC, 0818,0038,0DF8,0800,0000,11ED   ;1957   COFF:   D_K[.3],Q_0
U 11ED, 0000,003C,6180,0800,0084,71EE   ;1958           SC_K[.F]
U 11EE, 0D00,003C,0180,0800,0000,11EF   ;1959           D_DAL.SC
U 11EF, 0000,003E,7580,3C00,0000,0001   ;1960           ID[MAINT]_D,RETURN1
                                        ;1961   ; THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
                                        ;1962   ; APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.
U 11F0, 0000,003C,8580,0800,0084,71F1   ;1963   SOFF:   SC_K[.C]
U 11F1, 0803,001C,0180,0800,0000,11F2   ;1964           ALU_NOT.MASK,D_ALU
U 11F2, 0000,003E,7580,3C00,0000,0001   ;1965           ID[MAINT]_D,RETURN1
                                        ;1966   ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                        ;1967   ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                        ;1968   ; CERTAIN TRAPS.
                                        ;1969   =0
U 1034, 0000,003D,0180,0800,0000,1238   ;1970   DC.DE:  CALL,J/DCD
```

```
U 1035, 0000,003C,0180,0800,0000,103C   ;1971           NOP
U 103C, 0000,003D,0180,0800,0000,1239   ;1972   =0      CALL,J/DCE
U 103D, 0000,003E,0180,0800,0000,0001   ;1973           RETURN1
                                        ;1974   ; THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
                                        ;1975   ; IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
                                        ;1976   ; VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
                                        ;1977   ; MME WILL BE SET HERE. UPON RETURN THE CONTENTS
                                        ;1978   ; OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
                                        ;1979   ; D AND Q ARE LOST.
                                        ;1980   ; THIS ROUTINE WRITES GROUP 1
                                        ;1981   =0
U 104C, 0F00,003D,0180,0800,0000,1233   ;1982   TBWR1:  D_0,CALL,J/DC8
U 104D, 0100,003C,0180,0800,0000,1058   ;1983   TBWR:   D_D.LEFT2,SI/ZERO
U 1058, 0100,003D,0180,0800,0000,122B   ;1984   =0      D_D.LEFT2,SI/ZERO,CALL,J/DC0
U 1059, 0100,003C,0180,0800,0000,105C   ;1985           D_D.LEFT2,SI/ZERO
U 105C, 0100,003D,0180,0800,0000,122C   ;1986   =0      D_D.LEFT2,SI/ZERO,CALL,J/DC1
U 105D, 0800,003C,4980,3E40,0000,11F3   ;1987   TBWRA:  ID[TBER0]_D,D_R[8]
U 11F3, 0000,003C,4180,3C00,0000,11F4   ;1988           ID[TBUF]_D
U 11F4, 0000,003E,4DF0,2C00,0000,0001   ;1989           Q_ID[TBER1],RETURN1
                                        ;1990   ; ROUTINE TO WRITE GROUP 0
                                        ;1991   =0
U 1078, 0F00,003D,0180,0800,0000,122F   ;1992   TBWR0:  D_0,CALL,J/DC4
U 1079, 0000,003C,0180,0800,0000,104D   ;1993           J7TBWR
                                        ;1994   ; ROUTINE TO WRITE BOTH GROUP 0 AND 1
                                        ;1995   =0
U 107A, 0F00,003D,0180,0800,0000,1233   ;1996   TBWRB:  D_0,CALL,J/DC8
U 107B, 0500,003C,0180,0800,0000,104D   ;1997           D_D.LEFT,SI/ZERO,J/TBWR
                                        ;1998   ; THIS ROUTINE WRITES THE TB RANDOMLY.
U 11F5, 0818,0038,0580,0800,0000,105D   ;1999   TBWRAN: D_K[.1],J/TBWRA
                                        ;2000   ; THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
                                        ;2001   ; THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
                                        ;2002   ; R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
                                        ;2003   ; TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
                                        ;2004   ; R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
                                        ;2005   =0
U 1080, 0800,003D,0180,0A30,0000,122B   ;2006   RELSUB: D_R[6],CALL,J/DC0
U 1081, 0500,003C,D980,0A28,0084,7082   ;2007           D_D.LEFT,SI/ZERO,SC_K[.9],LAB_R[5]
U 1082, 0003,0011,01C0,0800,0000,122B   ;2008   =0      A[U_MASK+1,Q_ALU,CA[L,J/DC0
U 1083, 001C,0024,01C0,0800,0000,11F6   ;2009           ALU_LA[ANDNOT]Q,Q_ALU
U 11F6, 081D,0030,0180,0800,0000,11F7   ;2010           ALU_D[OR]Q,D_ALU
U 11F7, 0200,003C,0180,0800,0000,11F8   ;2011           D_D.RIGHT2,SI/ZERO
U 11F8, 0001,003E,0180,0AB8,0000,0001   ;2012           R[7]_D,RETURN1
                                        ;2013   ; THIS SUBROUTINE IS CALLED TO RELOCATE THE VA, GET THE
                                        ;2014   ; TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
                                        ;2015   ; RETURN3 IF THEY ARE EQUAL; RETURN 2 IF THEY ARE NOT EQUAL;
                                        ;2016   ; AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
                                        ;2017   ; INDICATED IN R[E].
U 11F9, 0000,003C,0180,0A70,0000,11FA   ;2018   RELCHK: LAB_R[0E]
U 11FA, 0000,003C,0180,52F8,0000,11FB   ;2019           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERNCE
U 11FB, 0800,003C,69F0,2E78,0000,1200   ;2020           Q_ID[TIME.ADDR],D_R[0F]
U 1200, 0018,0038,1980,0AF8,0000,1201   ;2021           A[U_0(K),R[0F]_ALU
U 1201, 0000,003C,0180,0A70,0000,1202   ;2022           LAB_R[0E]
U 1202, 001C,2000,0180,0800,0010,1203   ;2023           ALU_LA[A-B]D,CLK.UBCC           ; SEE IF A TRAP OCCURRED.
U 1203, 0000,013C,0180,0800,0000,1084   ;2024           Z?
U 1084, 0001,003C,0180,09C8,0000,120C   ;2025   =0      RC[9]_D,J/TBTRUE        ; TRAPPED SO RETURN1.
```

```
U 1085, 0000,003C,0180,0800,0000,1086   ;2026           NOP
U 1086, 0F00,003D,0180,0800,0000,1239   ;2027   =0      D_0,CALL,J/DCE                  ; MASK OFF THE UPPER 4 BITS
U 1087, 0500,003C,0180,0800,0000,1204   ;2028           D_D.LEFT,SI/ZERO
U 1204, 0001,003C,0180,0800,0082,1205   ;2029           SC_D
U 1205, 0803,0010,0180,0800,0000,1206   ;2030           ALU_MASK+1,D_ALU
U 1206, 001D,2024,01C0,0800,0000,1207   ;2031           ALU_Q[ANDNOT]D,Q_ALU
U 1207, 0800,003C,0180,0A38,0000,1208   ;2032           D_R[7]                          ; SEE IF ADDRESS RELOCATED
U 1208, 0001,003C,0180,09E0,0000,1209   ;2033           RC[0C]_D
U 1209, 0001,203C,0180,09D8,0000,120A   ;2034           RC[0B]_Q
U 120A, 001D,2000,0180,0800,0010,120B   ;2035           ALU_Q-D,CLK.UBCC                ; PROPERLY.
U 120B, 0000,013C,0180,0800,0000,1088   ;2036           Z?
U 1088, 0000,003E,0180,0800,0000,0002   ;2037   =0      RETURN2                         ; INCORRECT.
U 1089, 0000,003E,0180,0800,0000,0003   ;2038           RETURN3                         ; OK
U 120C, 0000,003C,4DF0,2C00,0000,120D   ;2039   TBTRUE: Q_ID[TBER1]
U 120D, 0001,203E,0180,09F0,0000,0001   ;2040           RC[0E]_Q,RETURN1
                                        ;2041   ; THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
                                        ;2042   ; IF NO TRAP OCCURS WHEN THE REFERNCE IS MADE EXECUTE A RETURN1.
                                        ;2043   ; IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
                                        ;2044   ; A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
U 120E, 0000,003C,0180,0A70,0000,120F   ;2045   MISS:   LAB_R[0E]
U 120F, 0000,003C,0180,52F8,0000,1210   ;2046           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
U 1210, 0800,003C,0180,0A78,0000,1211   ;2047           D_R[0F]
U 1211, 0018,0038,1980,0AF8,0000,1212   ;2048           A[U_0(K),R[0F]_ALU
U 1212, 0000,003C,0180,0A70,0000,1213   ;2049           LAB_R[0E]
U 1213, 0001,003C,0180,09C8,0000,1214   ;2050           RC[9]_D
U 1214, 001C,2000,0180,0800,0010,1215   ;2051           ALU_LA[A-B]D,CLK.UBCC           ; SEE IF A TRAP OCCRRED.
U 1215, 0000,013C,0180,0800,0000,108A   ;2052           Z?
U 108A, 0000,003C,0180,0800,0000,1216   ;2053   =0      J/MISSA
U 108B, 0000,003E,0180,0800,0000,0001   ;2054           RETURN1                         ; NO TRAP SO RETURN1.
U 1216, 0000,003C,D580,0800,0084,7217   ;2055   MISSA:  SC_K[.6]                        ; IF A TRAP OCCURRED SEE
U 1217, 0001,0024,0180,0800,0010,1218   ;2056           ALU_D.ANDNOT.MASK,CLK.UBCC      ; IF IT WAS A TB MISS TRAP.
U 1218, 0000,013C,4DF0,2C00,0000,108C   ;2057           Z?,Q_ID[TBER1]
U 108C, 0001,203E,0180,09F0,0000,0002   ;2058   =0      RETURN2,RC[0E]_Q                ; NOT TB MISS.
U 108D, 0000,003E,0180,0800,0000,0003   ;2059           RETURN3                         ; TB MISS.
                                        ;2060   ; THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
                                        ;2061   ; RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
                                        ;2062   ; TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
                                        ;2063   ; HIT/MISS BIT IN TBER0 IS INCORRECT.
                                        ;2064   ; RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
                                        ;2065   ; CHECK HIT IN GROUP 0.
U 1219, 0000,003C,D580,0A70,0084,721A   ;2066   HIT0:   LAB_R[0E],SC_K[.6]
U 121A, 0000,003C,0180,52F8,0000,121B   ;2067   HIT:    R[0F]_LA,FS/MCT,MCT/READ.V.WCHK         ; NO TRAP IF HIT
U 121B, 0800,003C,49F0,2E78,0000,121C   ;2068           Q_ID[TBER0],D_R[0F]
U 121C, 0018,0038,1980,0AF8,0000,121D   ;2069           A[U_0(K),R[0F]_ALU
U 121D, 0001,203C,0180,09E8,0000,121E   ;2070           RC[0D]_Q
U 121E, 0003,001C,0180,09F0,0000,121F   ;2071           RC[0E]_ALU,ALU_NOT.MASK
U 121F, 0000,003C,0180,0A70,0000,1220   ;2072           LAB_R[0E]
U 1220, 001C,2000,0180,0800,0010,1221   ;2073           ALU_LA[A-B]D,CLK.UBCC                   ; SEE IF TRAP OCCURRED.
U 1221, 0001,013C,0180,09C8,0000,108E   ;2074           Z?,RC[9]_D
U 108E, 0000,003C,0180,0800,0000,1223   ;2075   =0      J/HITA                          ; TRAP OCCURRED.
U 108F, 0001,2024,0180,0800,0010,1222   ;2076           ALU_Q.ANDNOT.MASK,CLK.UBCC      ; NO TRAP BUT IS HIT/MISS BIT SET?
U 1222, 0000,013C,0180,0800,0000,1090   ;2077           Z?
U 1090, 0000,003E,0180,0800,0000,0004   ;2078   =0      RETURN4                         ; SET SO IT WAS A HIT.
U 1091, 0000,003E,0180,0800,0000,0003   ;2079           RETURN3                         ; CLEAR SO REFERENCE WAS A MISS.
U 1223, 0000,003C,D580,0800,0084,7224   ;2080   HITA:   SC_K[.6]                        ; TRAPPED, SO SEE IF TB MISS TRAP.
```

```
U 1224, 0001,0024,0180,0800,0010,1225   ;2081            ALU_D.ANDNOT.MASK,CLK.UBCC
U 1225, 0000,013C,0180,0800,0000,1092   ;2082            Z?
U 1092, 0000,003C,0180,0800,0000,120C   ;2083   =0       J/TBTRUE                        ; NOT TB MISS TRAP.
U 1093, 0000,003E,0180,0800,0000,0002   ;2084            RETURN2                         ; TB MISS TRAP OCCURRED.
                                        ;2085   ; CHECK HIT IN GROUP 1.
U 1226, 0000,003C,5D80,0A70,0084,721A   ;2086   HIT1:    LAB_R[0E],SC_K[.7],J/HIT
                                        ;2087   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 1227, 0118,0038,1B80,0800,0000,123B   ;2088   S00:     ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 1228, 0118,0038,0B80,0800,0000,123B   ;2089   S01:     ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1229, 0118,0038,0780,0800,0000,123B   ;2090   S10:     ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 122A, 0118,0038,C380,0800,0000,123B   ;2091   S11:     ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 122B, 0018,0038,1980,0800,0000,1227   ;2092   DC0:     ALU_0(K),J/S00
U 122C, 0018,0038,1980,0800,0000,1228   ;2093   DC1:     ALU_0(K),J/S01
U 122D, 0018,0038,1980,0800,0000,1229   ;2094   DC2:     ALU_0(K),J/S10
U 122E, 0018,0038,1980,0800,0000,122A   ;2095   DC3:     ALU_0(K),J/S11
U 122F, 0018,0038,0980,0800,0000,1227   ;2096   DC4:     ALU_K[.2],J/S00
U 1230, 0018,0038,0980,0800,0000,1228   ;2097   DC5:     ALU_K[.2],J/S01
U 1231, 0018,0038,0980,0800,0000,1229   ;2098   DC6:     ALU_K[.2],J/S10
U 1232, 0018,0038,0980,0800,0000,122A   ;2099   DC7:     ALU_K[.2],J/S11
U 1233, 0018,0038,0580,0800,0000,1227   ;2100   DC8:     ALU_K[.1],J/S00
U 1234, 0018,0038,0580,0800,0000,1228   ;2101   DC9:     ALU_K[.1],J/S01
U 1235, 0018,0038,0580,0800,0000,1229   ;2102   DCA:     ALU_K[.1],J/S10
U 1236, 0018,0038,0580,0800,0000,122A   ;2103   DCB:     ALU_K[.1],J/S11
U 1237, 0018,0038,C180,0800,0000,1227   ;2104   DCC:     ALU_K[.FFFF],J/S00
U 1238, 0018,0038,C180,0800,0000,1228   ;2105   DCD:     ALU_K[.FFFF],J/S01
U 1239, 0018,0038,C180,0800,0000,1229   ;2106   DCE:     ALU_K[.FFFF],J/S10
U 123A, 0018,0038,C180,0800,0000,122A   ;2107   DCF:     ALU_K[.FFFF],J/S11
U 123B, 0100,003E,0380,0800,0000,0001   ;2108   SX:      D_D.LEFT2,SI/7,RETURN1
U 123C, 0018,0038,01C0,0800,0000,1094   ;2109   DC.5:    Q_K[.8]
                                        ;2110   =0
U 1094, 0000,003D,0180,0800,0000,1230   ;2111   DC.5A:   CALL,J/DC5
U 1095, 0019,2000,05C0,0800,0010,123D   ;2112            ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 123D, 0000,013C,0180,0800,0000,1096   ;2113            Z?
U 1096, 0000,003C,0180,0800,0000,1094   ;2114   =0       J/DC.5A
U 1097, 0000,003E,0180,0800,0000,0001   ;2115            RETURN1
                                        ;2116   =0
U 1098, 0000,003D,0180,0800,0000,123C   ;2117   DC.A:    CALL,J/DC.5
U 1099, 0500,003E,0180,0800,0000,0001   ;2118            D_D.LEFT,SI/ZERO,RETURN1
U 123E, 0018,0038,01C0,0800,0000,109A   ;2119   DC.9:    Q_K[.8]
                                        ;2120   =0
U 109A, 0000,003D,0180,0800,0000,1234   ;2121   DC.9A:   CALL,J/DC9
U 109B, 0019,2000,05C0,0800,0010,123F   ;2122            ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 123F, 0000,013C,0180,0800,0000,10A0   ;2123            Z?
U 10A0, 0000,003C,0180,0800,0000,109A   ;2124   =0       J/DC.9A
U 10A1, 0000,003E,0180,0800,0000,0001   ;2125            RETURN1
                                        ;2126   =0
U 10A2, 0000,003D,0180,0800,0000,123E   ;2127   DC.C:    CALL,J/DC.9
U 10A3, 0018,0038,C180,0800,0000,1240   ;2128            ALU_K[.FFFF]
U 1240, 0600,003E,0380,0800,0000,0001   ;2129            D_D.RIGHT,SI/7,RETURN1
                                        ;2130   =0
U 10A4, 0000,003D,0180,0800,0000,123E   ;2131   DC.6:    CALL,J/DC.9
U 10A5, 0018,0038,0580,0800,0000,1241   ;2132            ALU_K[.1]
U 1241, 0100,003E,0380,0800,0000,0001   ;2133            D_D.LEFT2,SI/7,RETURN1
                                        ;2134   =0
U 10A6, 0000,003D,0180,0800,0000,123E   ;2135   DC.3:    CALL,J/DC.9
```

```
U 10A7, 0018,0038,C180,0800,0000,1242   ;2136           ALU_K[.FFFF]
U 1242, 0500,003E,0380,0800,0000,0001   ;2137           D_D.LEFT,SI/7,RETURN1
                                        ;2138   ; THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
                                        ;2139   ; A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
                                        ;2140   ; SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
                                        ;2141   ; FOLLOWING DATA PATTERNS:
                                        ;2142   ;
                                        ;2143   ;       R[0B]           7FFFC000
                                        ;2144   ;       R[0C]           A4000000
                                        ;2145   ;       R[0D]           001FFFFF
                                        ;2146   ;
                                        ;2147   ;       RC[0]           A4155555
                                        ;2148   ;       RC[1]           4CCCC000
                                        ;2149   ;       RC[2]           0AAAAA80
                                        ;2150   ;
                                        ;2151   ;       RC[3]           A4199999
                                        ;2152   ;       RC[4]           55554000
                                        ;2153   ;       RC[5]           0CCCCC80
                                        ;2154   ;
                                        ;2155   ;       RC[6]           A40AAAAA
                                        ;2156   ;       RC[7]           33330000
                                        ;2157   ;       RC[8]           05555500
                                        ;2158   ;
                                        ;2159   ;       R[0]            A4066666
                                        ;2160   ;       R[1]            2AAA8000
                                        ;2161   ;       R[2]            03333300
                                        ;2162   ;
U 1243, 0F18,0038,0580,0800,0000,1244   ;2163   TBWPTP: D_0,ALU_K[.1]
U 1244, 0218,0038,0B80,0800,0000,1245   ;2164           D_D.RIGHT2,SI/7,ALU_K[.2]
U 1245, 0218,0038,0B80,0800,0000,1246   ;2165           D_D.RIGHT2,SI/7,ALU_K[.2]
U 1246, 0200,003C,0380,0800,0000,1247   ;2166           D_D.RIGHT2,SI/7
U 1247, 0001,003C,0180,0AE0,0000,1248   ;2167           R[0C]_D
U 1248, 0000,003C,6180,0800,0084,7249   ;2168           SC_K[.F]
U 1249, 0043,0010,0180,0AD8,0000,124A   ;2169           ALU_MASK+1,R[0B]_ALU.RIGHT,SI/ZERO
U 124A, 081B,0000,0580,0800,0000,124B   ;2170           D_0-K[.1]
U 124B, 0018,0038,21C0,0800,0000,124C   ;2171           Q_K[.14]
U 124C, 0019,2014,0580,0800,0082,124D   ;2172           ALU_Q+K[.1],SC_ALU
U 124D, 0003,001C,01C0,0800,0000,124E   ;2173           ALU_NOT.MASK,Q_ALU
U 124E, 001D,2014,0180,0AE8,0000,10A8   ;2174           ALU_Q[A+B]D,R[0D]_ALU
U 10A8, 0000,003D,0180,0800,0000,123C   ;2175   =0      CALL,J/DC.5
U 10A9, 0000,003C,0180,0A68,0000,124F   ;2176           LAB_R[0D]
U 124F, 081C,2034,0180,0800,0000,1250   ;2177           ALU_LA[AND]D,D_ALU
U 1250, 081C,2030,0180,0A60,0000,1251   ;2178           LAB_R[0C],ALU_[A[OR]D,D_ALU
U 1251, 0001,003C,0180,0980,0000,10AA   ;2179           RC[0]_D
U 10AA, 0001,003D,0180,0AB0,0000,10A2   ;2180   =0      R[6]_D,CALL,J/DC.C
U 10AB, 0000,003C,0180,0A58,0000,1252   ;2181           LAB_R[0B]
U 1252, 081C,2034,0180,0988,0000,10AC   ;2182           ALU_LA[AND]D,D_ALU,RC[1]_ALU
U 10AC, 0001,003D,0180,0AA8,0000,1080   ;2183   =0      R[5]_D,CALL,J/RELSUB
U 10AD, 0001,003C,0180,0990,0000,10AE   ;2184           RC[2]_D
U 10AE, 0000,003D,0180,0800,0000,123E   ;2185   =0      CALL,J/DC.9
U 10AF, 0000,003C,0180,0A68,0000,1253   ;2186           LAB_R[0D]
U 1253, 081C,2034,0180,0800,0000,1254   ;2187           ALU_LA[AND]D,D_ALU
U 1254, 081C,2030,0180,0A60,0000,1255   ;2188           LAB_R[0C],ALU_[A[OR]D,D_ALU
U 1255, 0001,003C,0180,0998,0000,10B0   ;2189           RC[3]_D
U 10B0, 0001,003D,0180,0AB0,0000,123C   ;2190   =0      R[6]_D,CALL,J/DC.5
```

```
U 10B1, 0000,003C,0180,0A58,0000,1256   ;2191            LAB_R[0B]
U 1256, 081C,2034,0180,09A0,0000,10B2   ;2192            ALU_LA[AND]D,D_ALU,RC[4]_ALU
U 10B2, 0001,003D,0180,0AA8,0000,1080   ;2193   =0       R[5]_D,CALL,J/RELSUB
U 10B3, 0001,003C,0180,09A8,0000,10B4   ;2194            RC[5]_D
U 10B4, 0000,003D,0180,0800,0000,1098   ;2195   =0       CALL,J/DC.A
U 10B5, 0000,003C,0180,0A68,0000,1257   ;2196            LAB_R[0D]
U 1257, 081C,2034,0180,0800,0000,1258   ;2197            ALU_LA[AND]D,D_ALU
U 1258, 081C,2030,0180,0A60,0000,1259   ;2198            LAB_R[0C],ALU_LA[OR]D,D_ALU
U 1259, 0001,003C,0180,09B0,0000,10B6   ;2199            RC[6]_D
U 10B6, 0001,003D,0180,0AB0,0000,10A6   ;2200   =0       R[6]_D,CALL,J/DC.3
U 10B7, 0000,003C,0180,0A58,0000,125A   ;2201            LAB_R[0B]
U 125A, 081C,2034,0180,09B8,0000,10B8   ;2202            ALU_LA[AND]D,D_ALU,RC[7]_ALU
U 10B8, 0001,003D,0180,0AA8,0000,1080   ;2203   =0       R[5]_D,CALL,J/RELSUB
U 10B9, 0001,003C,0180,09C0,0000,10BA   ;2204            RC[8]_D
U 10BA, 0000,003D,0180,0800,0000,10A4   ;2205   =0       CALL,J/DC.6
U 10BB, 0000,003C,0180,0A68,0000,125B   ;2206            LAB_R[0D]
U 125B, 081C,2034,0180,0800,0000,125C   ;2207            ALU_LA[AND]D,D_ALU
U 125C, 081C,2030,0180,0A60,0000,125D   ;2208            LAB_R[0C],ALU_LA[OR]D,D_ALU
U 125D, 0001,003C,0180,0A80,0000,10C0   ;2209            R[0]_D
U 10C0, 0001,003D,0180,0AB0,0000,1098   ;2210   =0       R[6]_D,CALL,J/DC.A
U 10C1, 0000,003C,0180,0A58,0000,125E   ;2211            LAB_R[0B]
U 125E, 081C,2034,0180,0A88,0000,10C2   ;2212            ALU_LA[AND]D,D_ALU,R[1]_ALU
U 10C2, 0001,003D,0180,0AA8,0000,1080   ;2213   =0       R[5]_D,CALL,J/RELSUB
U 10C3, 0001,003E,0180,0A90,0000,0001   ;2214            R[2]_D,RETURN1
                                        ;2215   ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
                                        ;2216   ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
                                        ;2217   ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 125F, 0000,003F,0180,0800,0000,117C   ;2218   TARGC3:  SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001   ;2219   117C:    RETURN1
U 117D, 0000,003E,0180,0800,0000,0002   ;2220   117D:    RETURN2
U 117E, 0000,003E,0180,0800,0000,0003   ;2221   117E:    RETURN3
U 117F, 0000,003E,0180,0800,0000,0004   ;2222   117F:    RETURN4
U 11FC, 0000,003D,0180,0800,0000,11E0   ;2223   11FC:    ERROR1
U 11FD, 0000,003D,0180,0800,0000,11E0   ;2224   11FD:    ERROR1
U 11FE, 0000,003D,0180,0800,0000,11E0   ;2225   11FE:    ERROR1
U 11FF, 0000,003D,0180,0800,0000,11E0   ;2226   11FF:    ERROR1
```

```
                                                .PAGE   "TEST AC        ALIGN UTRAP LOGIC TEST"
                                        ;*****************************************************************
                                        ;++
                                        ; TEST  AC      ALIGN UTRAP LOGIC TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF THE UNALIGNED DATA TRAP LOGIC ON THE TBM
                                        ;       AND CEH. NOTICE THAT THIS TEST CAN BE (AND IS!) RUN
                                        ;       WITH THE TB DISABLED, MME=0.
                                        ;       THE FOLLOWING CONDITIONS ARE TESTED:
                                        ;               SUBTEST 1       VA<1:0>=0 AND DT/LONG
                                        ;               SUBTEST 2       VA<1:0>=1 AND DT/LONG
                                        ;               SUBTEST 3       VA<1:0>=2 AND DT/LONG
                                        ;               SUBTEST 4       VA<1:0>=2, DT/LONG AND MSC/SECOND REF
                                        ;               SUBTEST 5       VA<1:0>=1 AND DT/WORD
                                        ;               SUBTEST 6       VA<1:0>=2 AND DT/WORD
                                        ;               SUBTEST 7       VA<1:0>=3 AND DT/WORD
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       UTRAP FLAG
                                        ;               FLAG            UTRAP TYPE
                                        ;               ----            ----------
                                        ;               DE              NO UTRAP OCCURRED
                                        ;               5E              TB PARITY ERROR
                                        ;               9E              TB MISS
                                        ;               CE              TB PROTECTION ERROR
                                        ;               D6              TB MODIFY BIT ERROR
                                        ;               DA              X PAGE UTRAP
                                        ;               DC              UNALIGNED DATA UTRAP
                                        ;       ERROR CODE:
                                        ;               3=>BRANCH FAILURE
                                        ;               2=> TRAP ERROR
                                        ;
                                        ;
                                        ;               (NOTE THAT OTHER INFORMATION IS STATED
                                        ;               EXPLICITELY IN EACH SUBTEST BELOW)
                                        ;
                                        ;--
                                        ;*****************************************************************
                                        =0
U 10C4, 0000,003D,0180,0800,0000,11CC   ALIGN:  NEWTST
U 10C5, 0F00,003C,0180,0800,0000,1260           D_0
U 1260, 0000,003C,4980,3C00,0000,10C6           ID[TBERO]_D             ; TURN OFF MME
U 10C6, 0F00,003D,0180,0800,0000,1034   =0      D_0,CALL,J/DC.DE
U 10C7, 0001,003C,0180,0AF0,0000,10C8           R[OE]_D                 ; R[OE]=DE THE UTRAP FLAG
U 10C8, 0018,0039,0980,09F8,0000,11E9   =0      RC[OF]_K[.2],CALL,J/CSOFF ; TURN OFF THE CACHE AND SBI
U 10C9, 0000,003C,0180,0800,0000,10CA           NOP
                                        ;////////////////////////////////////////////////////////////////
                                        ;+
                                        ; FIRST TEST THE CONDITION WITH VA<1:0>=00 AND DATA TYPE=LONG
                                        ; WHICH SHOULDN'T TRAP.
                                        ;-
                                        =0
U 10CA, 0000,003D,0180,0800,0000,11E4   ALIGN1: SUBTEST
U 10CB, 0018,0038,0980,09E8,0000,10CC           RC[OD]_K[.2]
```

```
U 10CC, 0000,003D,0180,0800,0000,11DF   ;2282   =0      ERLOOP
U 10CD, 0018,0038,1980,0800,0200,1261   ;2283           VA_K[ZERO]              ; VA=0
U 1261, 0000,003C,0180,0A70,0000,1262   ;2284           LAB_R[OE]
U 1262, 0000,003C,0180,0AF8,0000,1263   ;2285           R[OF]_LA                ; SET UP THE TRAP FLAG
U 1263, 0000,003C,0180,5000,0000,1264   ;2286           DT/LONG,FS/MCT,MCT/READ.V.WCHK ; SHOULDN'T TRAP.
U 1264, 0800,003C,0180,0A78,0000,1265   ;2287           D_R[OF]                 ; SEE IF A UTRAP OCCURRED.
U 1265, 0003,003C,0180,0AF8,0000,1266   ;2288           R[OF]_0
U 1266, 0001,003C,0180,09F0,0000,1267   ;2289           RC[OE]_D
U 1267, 0000,003C,0180,0A70,0000,1268   ;2290           LAB_R[OE]
U 1268, 001C,2000,0180,0800,0010,1269   ;2291           ALU_LA[A-B]D,CLK.UBCC
U 1269, 0000,013C,0180,0800,0000,10CE   ;2292           Z?
U 10CE, 0000,003C,0180,0800,0000,126A   ;2293   =0      J/AL1A                  ; UTRAPPED
U 10CF, 0000,003C,0180,0800,0000,126C   ;2294           J/ALIGN15               ; OK, DIDN'T UTRAP
U 126A, 0019,0034,0980,0800,0010,126B   ;2295   AL1A:   ALU_D[AND]K[.2],CLK.UBCC ; SEE IF THE TRAP WAS AN ALIGNMENT ERROR
U 126B, 0000,013C,0180,0800,0000,10D0   ;2296           Z?
U 10D0, 0000,003D,0180,0800,0000,11E0   ;2297   =0      ERROR1                  ; NON ALIGNMENT UTRAP
U 10D1, 0000,003D,0180,0800,0000,11E0   ;2298           ERROR1                  ; ALIGNMENT UTRAP OCCURRED.
U 126C, 0000,003C,0180,1000,0000,126D   ;2299   ALIGN15:        DT/LONG,FS/MCT,MCT/TEST.WCHK ; NOW TEST BRANCH TB.TEST
U 126D, 0000,1D3C,0180,0800,0000,1017   ;2300           BEN/TB.TEST
U 1017, 0018,0039,0980,09E8,0000,11E0   ;2301   =10111  ERROR1,RC[OD]_K[.2]     ; BRANCH TB.TEST FAILED
U 101F, 0000,003C,0180,0800,0000,10D2   ;2302           NOP
                                        ;2303   ;////////////////////////////////////////////////////////////
                                        ;2304   ;+
                                        ;2305   ; TEST VA<1:0>=01 AND DT=LONG, A CONDITION WHICH SHOULD TRAP.
                                        ;2306   ;-
                                        ;2307   =0
U 10D2, 0000,003D,0180,0800,0000,11E4   ;2308   ALIGN2: SUBTEST
U 10D3, 0018,0038,0980,09E8,0000,10D4   ;2309           RC[OD]_K[.2]
U 10D4, 0000,003D,0180,0800,0000,11DF   ;2310   =0      ERLOOP
U 10D5, 0018,0038,0580,0800,0200,126E   ;2311           VA_K[.1]                ; VA=1
U 126E, 0000,003C,0180,0A70,0000,126F   ;2312           LAB_R[OE]
U 126F, 0000,003C,0180,0AF8,0000,1270   ;2313           R[OF]_LA                ; SET THE UTRAP FLAG
U 1270, 0000,003C,0180,5000,0000,1271   ;2314           DT/LONG,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP.
U 1271, 0800,003C,0180,0A78,0000,1272   ;2315           D_R[OF]                 ; SEE IF THE TRAP OCCURRED
U 1272, 0003,003C,0180,0AF8,0000,1273   ;2316           R[OF]_0
U 1273, 0001,003C,0180,09F0,0000,1274   ;2317           RC[OE]_D
U 1274, 0000,003C,0180,0A70,0000,1275   ;2318           LAB_R[OE]
U 1275, 001C,2000,0180,0800,0010,1276   ;2319           ALU_LA[A-B]D,CLK.UBCC
U 1276, 0000,013C,0180,0800,0000,10D6   ;2320           Z?
U 10D6, 0000,003C,0180,0800,0000,1277   ;2321   =0      J/AL2A                  ; OK UTRAPPED
U 10D7, 0000,003D,0180,0800,0000,11E0   ;2322           ERROR1                  ; REFERENCE DIDN'T UTRAP
U 1277, 0019,0034,0980,0800,0010,1278   ;2323   AL2A:   ALU_D[AND]K[.2],CLK.UBCC ; SEE IF THE UTARP WAS AN ALIGNMENT ERROR
U 1278, 0000,013C,0180,0800,0000,10D8   ;2324           Z?
U 10D8, 0000,003D,0180,0800,0000,11E0   ;2325   =0      ERROR1                  ; NON ALIGNMENT UTRAP
U 10D9, 0000,003C,0180,0800,0000,1279   ;2326           NOP                     ; ALIGNMENT UTRAP OCCURRED.
U 1279, 0000,003C,0180,1000,0000,127A   ;2327           DT/LONG,FS/MCT,MCT/TEST.WCHK ; NOW CHECK BRANCH TB.TEST
U 127A, 0000,1D3C,0180,0800,0000,1037   ;2328           BEN/TB.TEST
U 1037, 0000,003C,0180,0800,0000,10DA   ;2329   =10111  J/ALIGN3
U 103F, 0018,0039,0D80,09E8,0000,11E0   ;2330           ERROR1,RC[OD]_K[.3]     ; BRANCH TB.TEST FAILED AFTER
                                        ;2331                                   ; AN ALIGNMENT ERROR
                                        ;2332   ;////////////////////////////////////////////////////////////
                                        ;2333   ;+
                                        ;2334   ; TEST VA<1:0>=10 AND DT=LONG, WHICH SHOULD TRAP.
                                        ;2335   ;-
                                        ;2336   =0
```

```
U 10DA, 0000,003D,0180,0800,0000,11E4   ;2337   ALIGN3: SUBTEST
U 10DB, 0018,0038,0980,09E8,0000,10E0   ;2338           RC[0D]_K[.2]
U 10E0, 0000,003D,0180,0800,0000,11DF   ;2339   =0      ERLOOP
U 10E1, 0018,0038,0980,0800,0200,127B   ;2340           VA_K[.2]                ; VA=2
U 127B, 0000,003C,0180,0A70,0000,127C   ;2341           LAB_R[0E]
U 127C, 0000,003C,0180,0AF8,0000,127D   ;2342           R[0F]_LA                ; SET UP UTRAP FLAG
U 127D, 0000,003C,0180,5000,0000,127E   ;2343           DT/LONG,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP.
U 127E, 0800,003C,0180,0A78,0000,127F   ;2344           D_R[0F]                 ; SEE IF THE TRAP OCCURRED
U 127F, 0003,003C,0180,0AF8,0000,1280   ;2345           R[0F]_0
U 1280, 0001,003C,0180,09F0,0000,1281   ;2346           RC[0E]_D
U 1281, 0000,003C,0180,0A70,0000,1282   ;2347           LAB_R[0E]
U 1282, 001C,2000,0180,0800,0010,1283   ;2348           ALU_LA[A-B]D,CLK.UBCC
U 1283, 0000,013C,0180,0800,0000,10E2   ;2349           Z?
U 10E2, 0000,003C,0180,0800,0000,1284   ;2350   =0      J/AL3A                  ; UTRAPPED
U 10E3, 0000,003D,0180,0800,0000,11E0   ;2351           ERROR1                  ; NO UTRAP OCCURRED
U 1284, 0019,0034,0980,0800,0010,1285   ;2352   AL3A:   ALU_D[AND]K[.2],CLK.UBCC ; SEE IF THE UTRAP WAS AN ALIGNMENT ERROR
U 1285, 0000,013C,0180,0800,0000,10E4   ;2353           Z?
U 10E4, 0000,003D,0180,0800,0000,11E0   ;2354   =0      ERROR1                  ; NON ALIGNMENT UTRAP
U 10E5, 0000,003C,0180,0800,0000,10E6   ;2355           NOP                     ; ALIGNMENT UTRAP OCCURRED.
                                        ;2356   ;//////////////////////////////////////////////////////////////
                                        ;2357   ;+
                                        ;2358   ; TEST VA<1:0>=10 AND DT=LONG WITH MSC=SECOND REFERNCE. THIS
                                        ;2359   ; SHOULDN'T TRAP.
                                        ;2360   ;-
                                        ;2361   =0
U 10E6, 0000,003D,0180,0800,0000,11E4   ;2362   ALIGN4: SUBTEST
U 10E7, 0000,003C,0180,0800,0000,10E8   ;2363           NOP
U 10E8, 0000,003D,0180,0800,0000,11DF   ;2364   =0      ERLOOP
U 10E9, 0018,0038,0980,0800,0200,1286   ;2365           VA_K[.2]                ; VA=2
U 1286, 0000,003C,0180,0A70,0000,1287   ;2366           LAB_R[0E]
U 1287, 0000,003C,0180,0AF8,0000,1288   ;2367           R[0F]_LA                ; SET UP THE UTRAP FLAG
U 1288, 0000,003C,0180,5000,3000,1289   ;2368           DT/LONG,FS/MCT,MCT/READ.V.WCHK,MSC/SECOND.REF    ; SHOULDN'T TRAP.
U 1289, 0800,003C,0180,0A78,0000,128A   ;2369           D_R[0F]
U 128A, 0003,003C,0180,0AF8,0000,128B   ;2370           R[0F]_0
U 128B, 0001,003C,0180,09F0,0000,128C   ;2371           RC[0E]_D
U 128C, 0000,003C,0180,0A70,0000,128D   ;2372           LAB_R[0E]
U 128D, 001C,2000,0180,0800,0010,128E   ;2373           ALU_LA[A-B]D,CLK.UBCC
U 128E, 0000,013C,0180,0800,0000,10EA   ;2374           Z?
U 10EA, 0000,003C,0180,0800,0000,128F   ;2375   =0      J/AL4A                  ; UTRAPPED
U 10EB, 0000,003C,0180,0800,0000,10EE   ;2376           J/ALIGN5                ; OK, DIDN'T UTRAP
U 128F, 0019,0034,0980,0800,0010,1290   ;2377   AL4A:   ALU_D[AND]K[.2],CLK.UBCC
U 1290, 0000,013C,0180,0800,0000,10EC   ;2378           Z?
U 10EC, 0000,003D,0180,0800,0000,11E0   ;2379   =0      ERROR1                  ; NON ALIGNMENT UTRAP
U 10ED, 0000,003D,0180,0800,0000,11E0   ;2380           ERROR1                  ; ALIGNMENT UTRAP OCCURRED
                                        ;2381                                   ; ON SECOND REFERENCE.
                                        ;2382   ;+
                                        ;2383   ; TEST VA<1:0>=01 AND DT=WORD, WHICH SHOULDN'T TRAP.
                                        ;2384   ;-
                                        ;2385   =0
U 10EE, 0000,003D,0180,0800,0000,11E4   ;2386   ALIGN5: SUBTEST
U 10EF, 0000,003C,0180,0800,0000,10F0   ;2387           NOP
U 10F0, 0000,003D,0180,0800,0000,11DF   ;2388   =0      ERLOOP
U 10F1, 0018,0038,0580,0800,0200,1291   ;2389           VA_K[.1]
U 1291, 0000,003C,0180,0A70,0000,1292   ;2390           LAB_R[0E]
U 1292, 0000,003C,0180,0AF8,0000,1293   ;2391           R[0F]_LA
```

```
U 1293, 0000,403C,0180,5000,0000,1294   ;2392                DT/WORD,FS/MCT,MCT/READ.V.WCHK            ; SHOULDN'T TRAP.
U 1294, 0800,003C,0180,0A78,0000,1295   ;2393                D_R[OF]
U 1295, 0003,003C,0180,0AF8,0000,1296   ;2394                R[OF]_0
U 1296, 0001,003C,0180,09F0,0000,1297   ;2395                RC[OE]_D
U 1297, 0000,003C,0180,0A70,0000,1298   ;2396                LAB_R[OE]
U 1298, 001C,2000,0180,0800,0010,1299   ;2397                ALU_LA[A-B]D,CLK.UBCC
U 1299, 0000,013C,0180,0800,0000,10F2   ;2398                Z?
U 10F2, 0000,003C,0180,0800,0000,129A   ;2399     =0         J/AL5A                    ; UTRAPPED
U 10F3, 0000,003C,0180,0800,0000,10F6   ;2400                J/ALIGN6                  ; OK, DIDN'T UTRAP
U 129A, 0019,0034,0980,0800,0010,129B   ;2401     AL5A:      ALU_D[AND]K[.2],CLK.UBCC
U 129B, 0000,013C,0180,0800,0000,10F4   ;2402                Z?
U 10F4, 0000,003D,0180,0800,0000,11E0   ;2403     =0         ERROR1                    ; NON ALIGNMENT UTRAP
U 10F5, 0000,003D,0180,0800,0000,11E0   ;2404                ERROR1                    ; ALIGNMENT UTRAP OCCURRED.
                                        ;2405     ;+
                                        ;2406     ; TEST VA<1:0>=10 AND DT=WORD, WHICH SHOULDN'T TRAP.
                                        ;2407     ;-
                                        ;2408     =0
U 10F6, 0000,003D,0180,0800,0000,11E4   ;2409     ALIGN6: SUBTEST
U 10F7, 0000,003C,0180,0800,0000,10F8   ;2410                NOP
U 10F8, 0000,003D,0180,0800,0000,11DF   ;2411     =0         ERLOOP
U 10F9, 0018,0038,0980,0800,0200,129C   ;2412                VA_K[.2]
U 129C, 0000,003C,0180,0A70,0000,129D   ;2413                LAB_R[OE]
U 129D, 0000,003C,0180,0AF8,0000,129E   ;2414                R[OF]_LA
U 129E, 0000,403C,0180,5000,0000,129F   ;2415                DT/WORD,FS/MCT,MCT/READ.V.WCHK            ; SHOULDN'T TRAP.
U 129F, 0800,003C,0180,0A78,0000,12A0   ;2416                D_R[OF]
U 12A0, 0003,003C,0180,0AF8,0000,12A1   ;2417                R[OF]_0
U 12A1, 0001,003C,0180,09F0,0000,12A2   ;2418                RC[OE]_D
U 12A2, 0000,003C,0180,0A70,0000,12A3   ;2419                LAB_R[OE]
U 12A3, 001C,2000,0180,0800,0010,12A4   ;2420                ALU_LA[A-B]D,CLK.UBCC
U 12A4, 0000,013C,0180,0800,0000,10FA   ;2421                Z?
U 10FA, 0000,003C,0180,0800,0000,12A5   ;2422     =0         J/AL6A                    ; UTRAPPED
U 10FB, 0000,003C,0180,0800,0000,1110   ;2423                J/ALIGN7                  ; OK, DIDN'T UTRAP
U 12A5, 0019,0034,0980,0800,0010,12A6   ;2424     AL6A:      ALU_D[AND]K[.2],CLK.UBCC
U 12A6, 0000,013C,0180,0800,0000,110A   ;2425                Z?
U 110A, 0000,003D,0180,0800,0000,11E0   ;2426     =0         ERROR1                    ; NON ALIGNMENT UTRAP
U 110B, 0000,003D,0180,0800,0000,11E0   ;2427                ERROR1                    ; ALIGNMENT UTRAP OCCURRED.
                                        ;2428     ;+
                                        ;2429     ; TEST VA<1:0>=11 AND DT=WORD, WHICH SHOULD TRAP.
                                        ;2430     ;-
                                        ;2431     =0
U 1110, 0000,003D,0180,0800,0000,11E4   ;2432     ALIGN7: SUBTEST
U 1111, 0000,003C,0180,0800,0000,1112   ;2433                NOP
U 1112, 0000,003D,0180,0800,0000,11DF   ;2434     =0         ERLOOP
U 1113, 0018,0038,0D80,0800,0200,12A7   ;2435                VA_K[.3]
U 12A7, 0000,003C,0180,0A70,0000,12A8   ;2436                LAB_R[OE]
U 12A8, 0000,003C,0180,0AF8,0000,12A9   ;2437                R[OF]_LA
U 12A9, 0000,403C,0180,5000,0000,12AB   ;2438                DT/WORD,FS/MCT,MCT/READ.V.WCHK            ; SHOULD TRAP.
U 12AB, 0800,003C,0180,0A78,0000,12AC   ;2439                D_R[OF]
U 12AC, 0003,003C,0180,0AF8,0000,12AD   ;2440                R[OF]_0
U 12AD, 0001,003C,0180,09F0,0000,12AE   ;2441                RC[OE]_D
U 12AE, 0000,003C,0180,0A70,0000,12AF   ;2442                LAB_R[OE]
U 12AF, 001C,2000,0180,0800,0010,12B0   ;2443                ALU_LA[A-B]D,CLK.UBCC
U 12B0, 0000,013C,0180,0800,0000,1114   ;2444                Z?
U 1114, 0000,003C,0180,0800,0000,12B1   ;2445     =0         J/AL7A                    ; UTRAPPED
U 1115, 0000,003D,0180,0800,0000,11E0   ;2446                ERROR1                    ; OK, DIDN'T UTRAP
```

```
U 12B1, 0019,0034,0980,0800,0010,12B2   ;2447   AL7A:   ALU_D[AND]K[.2],CLK.UBCC
U 12B2, 0000,013C,0180,0800,0000,1116   ;2448           Z?
U 1116, 0000,003D,0180,0800,0000,11E0   ;2449   =0      ERROR1                   ; NON ALIGNMENT UTRAP
U 1117, 0000,003C,0180,0800,0000,1118   ;2450           NOP                      ; ALIGNMENT UTRAP OCCURRED.
```

```
                                          ;2451           .PAGE   "TEST AD        CROSS PAGE UTRAP USING DT/LONG TEST"
                                          ;2452   ;*******************************************************************
                                          ;2453   ;++
                                          ;2454   ; TEST  AD      CROSS PAGE UTRAP USING DT/LONG TEST
                                          ;2455   ;
                                          ;2456   ; TEST DESCRIPTION
                                          ;2457   ;       THIS IS A TEST OF THE CROSS PAGE ERROR DETECTION LOGIC
                                          ;2458   ;       IN THE TB USING DT=LONG.
                                          ;2459   ;
                                          ;2460   ; ERROR DESCRIPTION
                                          ;2461   ;       VA USED IN TEST
                                          ;2462   ;       UTRAP FLAG
                                          ;2463   ;               FLAG            UTRAP TYPE
                                          ;2464   ;               ----            ----------
                                          ;2465   ;               DE              NO UTRAP OCCURRED
                                          ;2466   ;               5E              TB PARITY ERROR
                                          ;2467   ;               9E              TB MISS
                                          ;2468   ;               CE              TB PROTECTION ERROR
                                          ;2469   ;               D6              TB MODIFY BIT ERROR
                                          ;2470   ;               DA              X PAGE UTRAP
                                          ;2471   ;               DC              UNALIGNED DATA UTRAP
                                          ;2472   ;
                                          ;2473   ;--
                                          ;2474   ;*******************************************************************
                                          ;2475   =0
U 1118, 0000,003D,0180,0800,0000,11CC     ;2476   LEDGE:  NEWTST
U 1119, 0018,0038,0980,09F8,0000,111A     ;2477           RC[0F]_K[.2]
U 111A, 0000,003D,0180,0800,0000,1243     ;2478   =0      CALL,J/TBWPTP
U 111B, 0818,0038,8180,0800,0000,12B3     ;2479           D_K[.3FF]
U 12B3, 0600,003C,0180,0800,0000,12B4     ;2480           D_D.RIGHT,SI/ZERO
U 12B4, 0001,003C,0180,0A88,0000,12B5     ;2481           R[1]_D
U 12B5, 0019,0024,0D80,0A90,0000,12B6     ;2482           ALU_D[ANDNOT]K[.3],R[2]_ALU
U 12B6, 0010,0038,01C0,0908,0000,12B7     ;2483           Q_RC[1]
U 12B7, 001D,2030,0180,0A98,0000,12B8     ;2484           ALU_Q[OR]D,R[3]_ALU
U 12B8, 0018,0038,0180,0A80,0000,1120     ;2485           R[0]_K[.8]
U 1120, 0000,003D,0180,0800,0000,11E9     ;2486   =0      CALL,J/CSOFF
U 1121, 0010,0038,0180,0908,0200,12B9     ;2487           VA_RC[1]
U 12B9, 0000,003C,0180,0900,0000,1122     ;2488           LC_RC[0]
U 1122, 0010,0039,0180,0AC0,0000,107A     ;2489   =0      R[8]_LC,CALL,J/TBWRB
U 1123, 0F00,003C,0180,0800,0000,1124     ;2490           D_0
U 1124, 0000,003D,0180,0800,0000,1034     ;2491   =0      CALL,J/DC.DE
U 1125, 0001,003C,0180,0AF0,0000,1126     ;2492           R[0E]_D
U 1126, 0000,003D,0180,0800,0000,11DF     ;2493   =0      ERLOOP
U 1127, 0000,003C,0180,0A00,0082,12BA     ;2494   LEDGE1: SC_R[0]
U 12BA, 0800,003C,0180,0A18,0000,12BB     ;2495           D_R[3]
U 12BB, 0801,0034,0180,09F0,0200,12BC     ;2496           ALU_D.AND.MASK,D_ALU,VA_ALU,RC[0E]_ALU
U 12BC, 0000,003C,01C0,0A10,0000,12BD     ;2497           Q_R[2]
U 12BD, 001D,2024,0180,0800,0010,12BE     ;2498           ALU_Q[ANDNOT]D,CLK.UBCC
U 12BE, 0000,013C,0180,0800,0000,1128     ;2499           Z?
U 1128, 0000,003C,0180,0800,0000,12C0     ;2500   =0      J/LEDGE2                        ; EXPECT NO TRAP
U 1129, 0019,0034,0D80,0800,0010,12BF     ;2501           ALU_D[AND]K[.3],CLK.UBCC
U 12BF, 0000,013C,0180,0800,0000,112A     ;2502           Z?
U 112A, 0000,003C,0180,0800,0000,12CF     ;2503   =0      J/LEDGE5                        ; EXPECT A TRAP
U 112B, 0000,003C,0180,0800,0000,12C2     ;2504           J/LEDGE3                        ; EXPECT NO TRAP
U 12C0, 0000,003C,0180,0800,0000,12C1     ;2505   LEDGE2: NOP                     ; SIMPLIFIES FAILCHAIN CLOCKING
```

```
U 12C1, 0000,003C,0180,0800,0000,12C2   ;2506             NOP
U 12C2, 0000,003C,0180,0A70,0000,12C3   ;2507     LEDGE3: LAB_R[0E]
U 12C3, 0000,003C,0180,0AF8,0000,12C4   ;2508             R[0F]_LA
U 12C4, 0000,003C,0180,5000,0000,12C5   ;2509             DT/LONG,FS/MCT,MCT/READ.V.WCHK          ; SHOULDN'T TRAP.
U 12C5, 0800,003C,0180,0A78,0000,12C6   ;2510             D_R[0F]
U 12C6, 0003,003C,0180,0AF8,0000,12C7   ;2511             R[0F]_0
U 12C7, 0001,003C,0180,09E8,0000,12C8   ;2512             RC[0D]_D
U 12C8, 0000,003C,01C0,0A70,0000,12C9   ;2513             Q_R[0E]
U 12C9, 001D,2000,0180,0800,0010,12CA   ;2514             A[U_Q-D,CLK.UBCC
U 12CA, 0000,013C,0180,0800,0000,112C   ;2515             Z?
U 112C, 0000,003C,0180,0800,0000,12CB   ;2516     =0      J/LEDGE4                        ; A UTRAP OCCURRED.
U 112D, 0000,003C,0180,0800,0000,12DA   ;2517             J/LEDGE7                        ; NO UTRAP OCCURRED.
U 12CB, 0019,0034,1180,0800,0010,12CC   ;2518     LEDGE4: ALU_D[AND]K[.4],CLK.UBCC
U 12CC, 0000,013C,0180,0800,0000,112E   ;2519             Z?
U 112E, 0000,003C,0180,0800,0000,12CD   ;2520     =0      J/LEDGED                        ; A NON XPAGE TRAP OCCURRED.
U 112F, 0000,003D,0180,0800,0000,11E0   ;2521             ERROR1                          ; A XPAGE TRAP OCCURRED.
U 12CD, 0019,0034,0980,0800,0010,12CE   ;2522     LEDGED: ALU_D[AND]K[.2],CLK.UBCC
U 12CE, 0000,013C,0180,0800,0000,1130   ;2523             Z?
U 1130, 0000,003D,0180,0800,0000,11E0   ;2524     =0      ERROR1                          ; A NON ALIGNMENT UTRAP OCCURRED.
U 1131, 0000,003C,0180,0800,0000,12DA   ;2525             J/LEDGE7                        ; AN ALIGN UTRAP OCCURRED.
U 12CF, 0000,003C,0180,0A70,0000,12D0   ;2526     LEDGE5: LAB_R[0E]
U 12D0, 0000,003C,0180,0AF8,0000,12D1   ;2527             R[0F]_LA
U 12D1, 0000,003C,0180,5000,0000,12D2   ;2528             DT/LONG,FS/MCT,MCT/READ.V.WCHK          ; SHOULD TRAP.
U 12D2, 0800,003C,0180,0A78,0000,12D3   ;2529             D_R[0F]
U 12D3, 0003,003C,0180,0AF8,0000,12D4   ;2530             R[0F]_0
U 12D4, 0001,003C,0180,09E8,0000,12D5   ;2531             RC[0D]_D
U 12D5, 0000,003C,01C0,0A70,0000,12D6   ;2532             Q_R[0E]
U 12D6, 001D,2000,0180,0800,0010,12D7   ;2533             A[U_Q-D,CLK.UBCC
U 12D7, 0000,013C,0180,0800,0000,1132   ;2534             Z?
U 1132, 0000,003C,0180,0800,0000,12D8   ;2535     =0      J/LEDGE6                        ; A UTRAP OCCURRED
U 1133, 0000,003D,0180,0800,0000,11E0   ;2536             ERROR1                          ; NO UTRAP OCCURRED.
U 12D8, 0019,0034,1180,0800,0010,12D9   ;2537     LEDGE6: ALU_D[AND]K[.4],CLK.UBCC
U 12D9, 0000,013C,0180,0800,0000,1134   ;2538             Z?
U 1134, 0000,003D,0180,0800,0000,11E0   ;2539     =0      ERROR1                          ; A NON XPAGE UTRAP OCCURRED
U 1135, 0000,003C,0180,0800,0000,12DA   ;2540             NOP                             ; OK
U 12DA, 0000,003C,0180,0A00,0010,12DB   ;2541     LEDGE7: ALU_R[0],CLK.UBCC
U 12DB, 0000,013C,0180,0800,0000,1136   ;2542             Z?
U 1136, 0018,0000,0580,0A80,0000,1127   ;2543     =0      R[0]_LA-K[.1],J/LEDGE1
U 1137, 0000,003C,0180,0800,0000,1138   ;2544             NOP
```

```
                                                    .PAGE   "TEST AE        CROSS PAGE UTRAP USING DT/WORD TEST"
                                            ;*****************************************************************
                                            ;++
                                            ; TEST  AE      CROSS PAGE USING DT/WORD TEST
                                            ;
                                            ; TEST DESCRIPTION
                                            ;       THIS IS A TEST OF THE CROSS PAGE ERROR DETECTION LOGIC
                                            ;       IN THE TB USING DT=WORD.
                                            ;
                                            ; ERROR DESCRIPTION
                                            ;       VA USED IN TEST
                                            ;       UTRAP FLAG
                                            ;               FLAG            UTRAP TYPE
                                            ;               ----            ----------
                                            ;               DE              NO UTRAP OCCURRED
                                            ;               5E              TB PARITY ERROR
                                            ;               9E              TB MISS
                                            ;               CE              TB PROTECTION ERROR
                                            ;               D6              TB MODIFY BI~ ERROR
                                            ;               DA              X PAGE UTRAP
                                            ;               DC              UNALIGNED DATA UTRAP
                                            ;
                                            ;--
                                            ;*****************************************************************
                                            =0
U 1138, 0000,003D,0180,0800,0000,11CC       WEDGE:  NEWTST
U 1139, 0018,0038,0980,09F8,0000,113A               RC[OF]_K[.2]
U 113A, 0000,003D,0180,0800,0000,1243       =0      CALL,J/TBWPTP
U 113B, 0818,0038,8180,0800,0000,12DC               D_K[.3FF]
U 12DC, 0600,003C,0180,0800,0000,12DD               D_D.RIGHT,SI/ZERO
U 12DD, 0001,003C,0180,0A88,0000,12DE               R[1]_D
U 12DE, 0010,0038,01C0,0908,0000,12DF               Q_RC[1]
U 12DF, 001D,2030,0180,0A98,0000,12E0               A[U_Q[OR]D,R[3]_ALU
U 12E0, 0018,0038,D980,0A80,0000,113C               R[0]_K[.9]
U 113C, 0000,003D,0180,0800,0000,11E9       =0      CALL,J/CSOFF
U 113D, 0010,0038,0180,0908,0200,12E1               VA_RC[1]
U 12E1, 0000,003C,0180,0900,0000,113E               LC_RC[0]
U 113E, 0010,0039,0180,0AC0,0000,107A       =0      R[8]_LC,CALL,J/TBWRB
U 113F, 0F00,003C,0180,0800,0000,1140               D_0
U 1140, 0000,003D,0180,0800,0000,1034       =0      CALL,J/DC.DE
U 1141, 0001,003C,0180,0AF0,0000,1142               R[0E]_D
U 1142, 0000,003D,0180,0800,0000,11DF       =0      ERLOOP
U 1143, 0000,003C,0180,0A00,0082,12E2       WEDGE1: SC_R[0]
U 12E2, 0800,003C,0180,0A18,0000,12E3               D_R[3]
U 12E3, 0801,0034,0180,09F0,0200,12E4               A[U_D.AND.MASK,D_ALU,VA_ALU,RC[0E]_ALU
U 12E4, 0000,003C,01C0,0A08,0000,12E5               Q_R[1]
U 12E5, 001D,2024,0180,0800,0010,12E6               A[U_Q[ANDNOT]D,CLK.UBCC
U 12E6, 0000,013C,0180,0800,0000,1144               Z?
U 1144, 0000,003C,0180,0800,0000,12E7       =0      J/WEDGE3                        ; EXPECT NO TRAP
U 1145, 0000,003C,0180,0800,0000,12F4               J/WEDGE5                        ; EXPECT A TRAP
U 12E7, 0000,003C,0180,0A70,0000,12E8       WEDGE3: LAB_R[0E]
U 12E8, 0000,003C,0180,0AF8,0000,12E9               R[OF]_LA
U 12E9, 0000,403C,0180,5000,0000,12EA               DT/WORD,FS/MCT,MCT/READ.V.WCHK          ; SHOULDN'T TRAP.
U 12EA, 0800,003C,0180,0A78,0000,12EB               D_R[OF]
U 12EB, 0003,003C,0180,0AF8,0000,12EC               R[OF]_0
```

```
U 12EC, 0001,003C,0180,09E8,0000,12ED   ;2600              RC[OD]_D
U 12ED, 0000,003C,01C0,0A70,0000,12EE   ;2601              Q_R[OE]
U 12EE, 001D,2000,0180,0800,0010,12EF   ;2602              A[U_Q-D,CLK.UBCC
U 12EF, 0000,013C,0180,0800,0000,1146   ;2603              Z?
U 1146, 0000,003C,0180,0800,0000,12F0   ;2604     =0       J/WEDGE4                         ; A UTRAP OCCURRED.
U 1147, 0000,003C,0180,0800,0000,12FF   ;2605              J/WEDGE7                         ; NO UTRAP OCCURRED.
U 12F0, 0019,0034,1180,0800,0010,12F1   ;2606     WEDGE4:  ALU_D[AND]K[.4],CLK.UBCC
U 12F1, 0000,013C,0180,0800,0000,1148   ;2607              Z?
U 1148, 0000,003C,0180,0800,0000,12F2   ;2608     =0       J/WEDGED                         ; A NON XPAGE TRAP OCCURRED.
U 1149, 0000,003D,0180,0800,0000,11E0   ;2609              ERROR1                           ; A XPAGE TRAP OCCURRED.
U 12F2, 0019,0034,0980,0800,0010,12F3   ;2610     WEDGED:  ALU_D[AND]K[.2],CLK.UBCC
U 12F3, 0000,013C,0180,0800,0000,114A   ;2611              Z?
U 114A, 0000,003D,0180,0800,0000,11E0   ;2612     =0       ERROR1               ; A NON ALIGN UTRAP OCCURRED.
U 114B, 0000,003C,0180,0800,0000,12FF   ;2613              J/WEDGE7                         ; AN ALIGN ERROR OCCURRED.
U 12F4, 0000,003C,0180,0A70,0000,12F5   ;2614     WEDGE5:  LAB_R[OE]
U 12F5, 0000,003C,0180,0AF8,0000,12F6   ;2615              R[OF]_LA
U 12F6, 0000,403C,0180,5000,0000,12F7   ;2616              DT/WORD,FS/MCT,MCT/READ.V.WCHK           ; SHOULD TRAP.
U 12F7, 0800,003C,0180,0A78,0000,12F8   ;2617              D_R[OF]
U 12F8, 0003,003C,0180,0AF8,0000,12F9   ;2618              R[OF]_0
U 12F9, 0001,003C,0180,09E8,0000,12FA   ;2619              RC[OD]_D
U 12FA, 0000,003C,01C0,0A70,0000,12FB   ;2620              Q_R[OE]
U 12FB, 001D,2000,0180,0800,0010,12FC   ;2621              A[U_Q-D,CLK.UBCC
U 12FC, 0000,013C,0180,0800,0000,114C   ;2622              Z?
U 114C, 0000,003C,0180,0800,0000,12FD   ;2623     =0       J/WEDGE6                         ; A UTRAP OCCURRED
U 114D, 0000,003D,0180,0800,0000,11E0   ;2624              ERROR1                           ; NO UTRAP OCCURRED.
U 12FD, 0019,0034,1180,0800,0010,12FE   ;2625     WEDGE6:  ALU_D[AND]K[.4],CLK.UBCC
U 12FE, 0000,013C,0180,0800,0000,114E   ;2626              Z?
U 114E, 0000,003D,0180,0800,0000,11E0   ;2627     =0       ERROR1                           ; A NON XPAGE UTRAP OCCURRED
U 114F, 0000,003C,0180,0800,0000,12FF   ;2628              NOP                              ; OK
U 12FF, 0000,003C,0180,0A00,0010,1300   ;2629     WEDGE7:  ALU_R[O],CLK.UBCC
U 1300, 0000,013C,0180,0800,0000,1150   ;2630              Z?
U 1150, 0018,0000,0580,0A80,0000,1143   ;2631     =0       R[O]_LA-K[.1],J/WEDGE1
U 1151, 0000,003C,0180,0800,0000,1152   ;2632              NOP
```

```
                                      ;2633          .PAGE   "TEST AF       CROSS PAGE UTRAP ENABLE TEST"
                                      ;2634   ;*****************************************************************
                                      ;2635   ;++
                                      ;2636   ; TEST  AF      CROSS PAGE UTRAP ENABLE TEST
                                      ;2637   ;
                                      ;2638   ; TEST DESCRIPTION
                                      ;2639   ;       THIS TEST INSURES THAT DEASSERTING MME (TBER0 <0>)
                                      ;2640   ;       INHIBITS XPAGE TRAPS.
                                      ;2641   ;
                                      ;2642   ; ERROR DESCRIPTION
                                      ;2643   ;       UTRAP FLAG
                                      ;2644   ;               FLAG            UTRAP TYPE
                                      ;2645   ;               ----            ----------
                                      ;2646   ;               DE              NO UTRAP OCCURRED
                                      ;2647   ;               5E              TB PARITY ERROR
                                      ;2648   ;               9E              TB MISS
                                      ;2649   ;               CE              TB PROTECTION ERROR
                                      ;2650   ;               D6              TB MODIFY BIT ERROR
                                      ;2651   ;               DA              X PAGE UTRAP
                                      ;2652   ;               DC              UNALIGNED DATA UTRAP
                                      ;2653   ;
                                      ;2654   ;--
                                      ;2655   ;*****************************************************************
                                      ;2656   =0
U 1152, 0000,003D,0180,0800,0000,11CC ;2657   NEDGE:  NEWTST
U 1153, 0000,003C,0180,0800,0000,1156 ;2658           NOP
U 1156, 0000,003D,0180,0800,0000,11E9 ;2659   =0      CALL,J/CSOFF
U 1157, 0F00,003C,0180,0800,0000,1158 ;2660           D_0
U 1158, 0000,003D,0180,0800,0000,1034 ;2661   =0      CALL,J/DC.DE
U 1159, 0001,003C,0180,0AF0,0000,115A ;2662           R[0E]_D
U 115A, 0000,003D,0180,0800,0000,11DF ;2663   =0      ERLOOP
U 115B, 0F00,003C,0180,0800,0000,1301 ;2664           D_0
U 1301, 0000,003C,4980,3C00,0000,1302 ;2665           ID[TBER0]_D
U 1302, 0018,0038,8180,0800,0200,1303 ;2666           VA_K[.3FF]
U 1303, 0000,003C,0180,0A70,0000,1304 ;2667           LAB_R[0E]
U 1304, 0000,003C,0180,0AF8,0000,1305 ;2668           R[0F]_LA
U 1305, 0000,003C,0180,5000,0000,1306 ;2669           DT/LONG,FS/MCT,MCT/READ.V.WCHK          ; SHOULDN'T TRAP.
U 1306, 0800,003C,0180,0A78,0000,1307 ;2670           D_R[0F]
U 1307, 0003,003C,0180,0AF8,0000,1308 ;2671           R[0F]_0
U 1308, 0018,0038,0580,09F8,0000,1309 ;2672           RC[0F]_K[.1]
U 1309, 0001,003C,0180,09F0,0000,130A ;2673           RC[0E]_D
U 130A, 0000,003C,01C0,0A70,0000,130B ;2674           Q_R[0E]
U 130B, 001D,2000,0180,0800,0010,130C ;2675           ALU_Q-D,CLK.UBCC
U 130C, 0000,013C,0180,0800,0000,115C ;2676           Z?
U 115C, 0000,003C,0180,0800,0000,130D ;2677   =0      J/NEDGE1
U 115D, 0000,003C,0180,0800,0000,1161 ;2678           J/NEDGE2
U 130D, 0019,0034,1180,0800,0010,130E ;2679   NEDGE1: ALU_D[AND]K[.4],CLK.UBCC
U 130E, 0000,013C,0180,0800,0000,115E ;2680           Z?
U 115E, 0000,003C,0180,0800,0000,130F ;2681   =0      J/NEDGE3                        ; A NON XPAGE TRAP OCCURRED.
U 115F, 0000,003D,0180,0800,0000,11E0 ;2682           ERROR1                          ; A XPAGE UTRAP OCCURRED.
U 130F, 0019,0034,0580,0800,0010,1310 ;2683   NEDGE3: ALU_D[AND]K[.1],CLK.UBCC
U 1310, 0000,013C,0180,0800,0000,1160 ;2684           Z?
U 1160, 0000,003D,0180,0800,0000,11E0 ;2685   =0      ERROR1          ; THE UTRAP WAS NOT AN ALIGNMENT
                                      ;2686                                   ; OR XPAGE ERROR
U 1161, 0000,003C,0180,0800,0000,1162 ;2687   NEDGE2: NOP
```

```
                                                 .PAGE   "TEST B0        TB PROTECTION LOGIC TEST"
                                          ;*************************************************************
                                          ;++
                                          ; TEST  B0       TB PROTECTION LOGIC TEST
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS IS A TEST OF THE ACCESS PROTECT LOGIC. ONE
                                          ;       LOCATION IN THE TB (OF EACH GROUP) IS USED TO TEST THE
                                          ;       PROTECT LOGIC'S RESPONSE TO EVERY POSSIBLE ACCESS CODE
                                          ;       WITH EVERY PROCESSOR MODE (PSL<25:24>).
                                          ;       NOTE THAT       SUBTEST 1 TESTS GROUP 0.
                                          ;                       SUBTEST 2 TESTS GROUP 1.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       PTE BEING USED
                                          ;       PSL (ONLY THE CURRENT MODE BITS ARE RELEVANT)
                                          ;       UTRAP FLAG
                                          ;               FLAG            UTRAP TYPE
                                          ;               ----            ----------
                                          ;               DE              NO UTRAP OCCURRED
                                          ;               5E              TB PARITY ERROR
                                          ;               9E              TB MISS
                                          ;               CE              TB PROTECTION ERROR
                                          ;               D6              TB MODIFY BIT ERROR
                                          ;               DA              X PAGE UTRAP
                                          ;               DC              UNALIGNED DATA UTRAP
                                          ;       VA
                                          ;       ERROR CODE A:
                                          ;               0=> NO UTRAP EXPECTED
                                          ;               1=> UTRAP EXPECTED
                                          ;
                                          ;       ERROR CODE B:
                                          ;               0=> FIRST TRAP ATTEMPT COMPLETE (WANTED ONE AND GOT ONE)
                                          ;               1=> FIRST TRAP ATTEMPT NOT COMPLETE
                                          ;
                                          ;--
                                          ;*************************************************************
                                          =0
U 1162, 0000,003D,0180,0800,0000,11CC     PROTEST:        NEWTST
U 1163, 0000,003C,0180,0800,0000,1164             NOP
U 1164, 0000,003D,0180,0800,0000,11E9     =0      CALL,J/CSOFF
U 1165, 0003,003C,0180,0A90,0000,1166             R[2]_0                  ; R[2]=PROTECTION CODE
U 1166, 0000,003D,0180,0800,0000,1243     =0      CALL,J/TBWPTP
U 1167, 0003,003C,0180,0A98,0000,1311             R[3]_0                  : R[3]_PSL MODE
U 1311, 0018,0038,5580,0A88,0000,1168             R[1]_K[.3F]
U 1168, 0F00,003D,0180,0800,0000,123A     =0      D_0,CALL,J/DCF
U 1169, 0000,003C,EDF8,0800,0084,7312             SC_K[.1B],Q_0
U 1312, 0D00,003C,0180,0800,0000,1313             D_DAL.SC
U 1313, 0001,0028,0180,0AA0,0000,116A             A[U_NOT.D,R[4]_ALU      ; R[4]=PTE MASK=87FFFFFF
U 116A, 0F00,003D,0180,0800,0000,1034     =0      D_0,CALL,J/DC.DE
U 116B, 0001,003C,0180,0AF0,0000,1314             R[0E]_D
U 1314, 0018,0038,D580,09F8,0000,1315             RC[0F]_K[.6]
U 1315, 0018,0038,0580,09C8,0000,116C             RC[9]_K[.1]             ; TRAP NOT YET TRIED FLAG
U 116C, 0000,003D,0180,0800,0000,11E4     =0      SUBTEST
U 116D, 0000,003C,0180,0800,0000,116E             NOP
```

```
U 116E, 0000,003D,0180,0800,0000,11DF   ;2743   =0      ERLOOP
U 116F, 0010,0038,0180,0908,0200,1316   ;2744   PROT1:  VA_RC[1]
U 1316, 0000,003C,0180,0900,0000,1170   ;2745           LC_RC[0]
U 1170, 0010,0039,0180,0AC0,0000,107A   ;2746   =0      R[8]_LC,CALL,J/TBWRB
U 1171, 0800,003C,01F8,0A18,0000,1317   ;2747           D_R[3],Q_0
U 1317, 0000,003C,7D80,0800,0084,7318   ;2748           SC_K[.18]
U 1318, 0D00,003C,0180,0800,0000,1319   ;2749           D_DAL.SC
U 1319, 0001,003C,0180,09E8,0000,131A   ;2750           RC[0D]_D
U 131A, 0000,003C,3D80,3C00,0000,131B   ;2751           ID[PSL]_D               ; SET PSL<25:24>=MODE
U 131B, 0010,0038,0180,0920,0200,131C   ;2752           VA_RC[4]
U 131C, 0010,0038,0180,09D8,0000,131D   ;2753           RC[0B]_LC
U 131D, 0800,003C,0180,0A10,0000,131E   ;2754           D_R[2]
U 131E, 0000,003C,EDF8,0800,0084,731F   ;2755           SC_K[.1B],Q_0
U 131F, 0D00,003C,0180,0A20,0000,1320   ;2756           D_DAL.SC,LAB_R[4]
U 1320, 0010,0034,01C0,0918,0000,1321   ;2757           LC_RC[3],ALU_LA[AND]LC,Q_ALU
U 1321, 081D,2030,0180,09F0,0000,1172   ;2758           ALU_Q[OR]D,RC[0E]_ALU,D_ALU
U 1172, 0001,003D,0180,0AC0,0000,1078   ;2759   =0      R[8]_D,CALL,J/TBWRO
U 1173, 0000,003C,0180,0A18,0000,1322   ;2760           LAB_R[3]
U 1322, 0000,003C,0180,09E0,0000,1323   ;2761           RC[0C]_LA
U 1323, 0000,003C,0180,0A10,0000,1324   ;2762           LAB_R[2]
U 1324, 0000,003C,0180,09D8,0000,1325   ;2763           RC[0B]_LA
U 1325, 0003,003C,0180,09D0,0000,1326   ;2764           RC[0A]_0
U 1326, 0800,003C,0180,0A10,0000,1174   ;2765           D_R[2]
U 1174, 0800,193D,0180,0A18,0000,1020   ;2766   =0      D_R[3],D3-0?,CALL,J/PRT1
U 1175, 0000,003C,0180,0A18,0000,1327   ;2767           LAB_R[3]
U 1327, 0018,0000,0D80,0800,0010,1328   ;2768           ALU_LA[A-B]K[.3],CLK.UBCC
U 1328, 0000,013C,0180,0800,0000,1176   ;2769           Z?
U 1176, 0018,0014,0580,0A98,0000,132B   ;2770   =0      R[3]_LA+K[.1],J/PROT2
U 1177, 0003,003C,0180,0A98,0000,1329   ;2771           R[3]_0
U 1329, 0000,003C,0180,0A10,0000,132A   ;2772           LAB_R[2]
U 132A, 0018,0014,0580,0A90,0000,132B   ;2773           R[2]_LA+K[.1]
U 132B, 0000,003C,0180,0A08,0010,132C   ;2774   PROT2:  ALU_R[1],CLK.UBCC
U 132C, 0000,013C,0180,0800,0000,1178   ;2775           Z?
U 1178, 0018,0000,0580,0A88,0000,116F   ;2776   =0      R[1]_LA-K[.1],J/PROT1
U 1179, 0010,0038,0180,0908,0200,132D   ;2777           VA_RC[1]
U 132D, 0010,0038,0180,09D0,0000,132E   ;2778           RC[0A]_LC
U 132E, 0000,003C,0180,0910,0000,1008   ;2779           LC_RC[2]
U 1008, 0010,0039,0180,0AB8,0000,1226   ;2780   =000    R[7]_LC,CALL,J/HIT1
U 1009, 0000,003D,0180,0800,0000,11E0   ;2781           ERROR1
U 100A, 0000,003D,0180,0800,0000,11E0   ;2782           ERROR1
U 100B, 0000,003D,0180,0800,0000,11E0   ;2783           ERROR1
U 100C, 0000,003D,0180,0800,0000,11F9   ;2784           CALL,J/RELCHK
U 100D, 0000,003D,0180,0800,0000,11E0   ;2785           ERROR1
U 100E, 0000,003D,0180,0800,0000,11E0   ;2786           ERROR1
U 100F, 0000,003C,0180,0800,0000,117A   ;2787           NOP
U 117A, 0000,003D,0180,0800,0000,11E4   ;2788   =0      SUBTEST
U 117B, 0018,0038,5580,0A88,0000,132F   ;2789           R[1]_K[.3F]
U 132F, 0003,003C,0180,0A90,0000,1330   ;2790           R[2]_0
U 1330, 0003,003C,0180,0A98,0000,1180   ;2791           R[3]_0
U 1180, 0000,003D,0180,0800,0000,11DF   ;2792   =0      ERLOOP
U 1181, 0010,0038,0180,0938,0200,1331   ;2793   PROT3:  VA_RC[7]
U 1331, 0000,003C,0180,0930,0000,1182   ;2794           LC_RC[6]
U 1182, 0010,0039,0180,0AC0,0000,107A   ;2795   =0      R[8]_LC,CALL,J/TBWRB
U 1183, 0800,003C,01F8,0A18,0000,1332   ;2796           D_R[3],Q_0
U 1332, 0000,003C,7D80,0800,0084,7333   ;2797           SC_K[.18]
```

```
U 1333, 0D00,003C,0180,0800,0000,1334   ;2798              D_DAL.SC
U 1334, 0001,003C,0180,09E8,0000,1335   ;2799              RC[0D]_D
U 1335, 0000,003C,3D80,3C00,0000,1336   ;2800              ID[PSL]_D
U 1336, 0010,0038,0180,0908,0200,1337   ;2801              VA_RC[1]
U 1337, 0010,0038,0180,09D8,0000,1338   ;2802              RC[0B]_LC
U 1338, 0800,003C,0180,0A10,0000,1339   ;2803              D_R[2]
U 1339, 0000,003C,EDF8,0800,0084,733A   ;2804              SC_K[.1B],Q_0
U 133A, 0D00,003C,0180,0A20,0000,133B   ;2805              D_DAL.SC,LAB_R[4]
U 133B, 0010,0034,01C0,0900,0000,133C   ;2806              LC_RC[0],ALU_LA[AND]LC,Q_ALU
U 133C, 081D,2030,0180,09F0,0000,1184   ;2807              ALU_Q[OR]D,RC[0E]_ALU,D_ALU
U 1184, 0001,003D,0180,0AC0,0000,104C   ;2808    =0        R[8]_D,CALL,J/TBWR1
U 1185, 0000,003C,0180,0A18,0000,133D   ;2809              LAB_R[3]
U 133D, 0000,003C,0180,09E0,0000,133E   ;2810              RC[0C]_LA
U 133E, 0000,003C,0180,0A10,0000,133F   ;2811              LAB_R[2]
U 133F, 0000,003C,0180,09D8,0000,1340   ;2812              RC[0B]_LA
U 1340, 0018,0038,0580,09D0,0000,1341   ;2813              RC[0A]_K[.1]
U 1341, 0800,003C,0180,0A10,0000,1186   ;2814              D_R[2]
U 1186, 0800,193D,0180,0A18,0000,1020   ;2815    =0        D_R[3],D3-0?,CALL,J/PRT1
U 1187, 0000,003C,0180,0A18,0000,1342   ;2816              LAB_R[3]
U 1342, 0018,0000,0D80,0800,0010,1343   ;2817              ALU_LA[A-B]K[.3],CLK.UBCC
U 1343, 0000,013C,0180,0800,0000,1188   ;2818              Z?
U 1188, 0018,0014,0580,0A98,0000,1346   ;2819    =0        R[3]_LA+K[.1],J/PROT4
U 1189, 0003,003C,0180,0A98,0000,1344   ;2820              R[3]_0
U 1344, 0000,003C,0180,0A10,0000,1345   ;2821              LAB_R[2]
U 1345, 0018,0014,0580,0A90,0000,1346   ;2822              R[2]_LA+K[.1]
U 1346, 0000,003C,0180,0A08,0010,1347   ;2823    PROT4:    ALU_R[1],CLK.UBCC
U 1347, 0000,013C,0180,0800,0000,118A   ;2824              Z?
U 118A, 0018,0000,0580,0A88,0000,1181   ;2825    =0        R[1]_LA-K[.1],J/PROT3
U 118B, 0010,0038,0180,0938,0200,1348   ;2826              VA_RC[7]
U 1348, 0010,0038,0180,09D0,0000,1349   ;2827              RC[0A]_LC
U 1349, 0000,003C,0180,0940,0000,1040   ;2828              LC_RC[8]
U 1040, 0010,0039,0180,0AB8,0000,1219   ;2829    =000      R[7]_LC,CALL,J/HIT0
U 1041, 0000,003D,0180,0800,0000,11E0   ;2830              ERROR1
U 1042, 0000,003D,0180,0800,0000,11E0   ;2831              ERROR1
U 1043, 0000,003D,0180,0800,0000,11E0   ;2832              ERROR1
U 1044, 0000,003D,0180,0800,000C,11F9   ;2833              CALL,J/RELCHK
U 1045, 0000,003D,0180,0800,0000,11E0   ;2834              ERROR1
U 1046, 0000,003D,0180,0800,0000,11E0   ;2835              ERROR1
U 1047, 0000,003C,0180,0800,0000,134A   ;2836              NOP
U 134A, 0000,003C,0180,0800,0000,139B   ;2837              J/PROTDN
                                        ;2838    ; THIS SUBROUTINE IS USED TO CHECK MODE VS. ACCESS CODE COMBINATIONS
                                        ;2839    ; WHICH ALLOW ACCESS FOR BOTH READS AND WRITES.
U 134B, 0000,003C,0180,0A70,0000,134C   ;2840    PROTC1:   LAB_R[0E]
U 134C, 0003,003C,0180,09D0,0000,134D   ;2841              RC[0A]_0               ; NO TRAP EXPECTED FLAG
U 134D, 0000,003C,0180,42F8,0000,134E   ;2842              R[0F]_[A,MCT/READ.V.RCHK
U 134E, 0800,003C,0180,0A78,0000,134F   ;2843              D_R[0F]
U 134F, 0003,003C,0180,0AF8,0000,1350   ;2844              R[0F]_0
U 1350, 0000,003C,0180,0A70,0000,1351   ;2845              LAB_R[0E]
U 1351, 0001,003C,0180,09E0,0000,1352   ;2846              RC[0C]_D
U 1352, 001C,2000,0180,0800,0010,1353   ;2847              ALU_LA[A-B]D,CLK.UBCC
U 1353, 0000,013C,0180,0800,0000,118C   ;2848              Z?
U 118C, 0000,003C,0180,0800,0000,1354   ;2849    =0        J/PROTC2                             ; UTRAP OCCRRED.
U 118D, 0000,003C,0180,0800,0000,1356   ;2850              J/PROTC3                   ; NO UTRAP
U 1354, 0019,0034,6580,0800,0010,1355   ;2851    PROTC2:   ALU_D[AND]K[.10],CLK.UBCC
U 1355, 0000,013C,0180,0800,0000,118E   ;2852              Z?
```

```
U 118E, 0000,003D,0180,0800,0000,11E0   ;2853   =0      ERROR1                          ; A UTRAP WHICH WAS NOT AN
                                        ;2854                                           ; ACCESS VIOLATION OCCURRED.
U 118F, 0000,003D,0180,0800,0000,11E0   ;2855           ERROR1                  ; AN ACCESS VIOLATION MICRO TRAP
                                        ;2856                                           ; OCCURRED.
U 1356, 0000,003C,0180,0000,0000,1357   ;2857   PROTC3: FS/MCT,MCT/TEST.RCHK
U 1357, 0000,1D3C,0180,0800,0000,107C   ;2658           BEN/TB.TEST
U 107C, 0000,003C,0180,0800,0000,1358   ;2859   =11100  J/PRTC3
U 107D, 0000,003D,0180,0800,0000,11E0   ;2860           ERROR1
U 107E, 0000,003D,0180,0800,0000,11E0   ;2861           ERRORI
U 107F, 0000,003D,0180,0800,0000,11E0   ;2862           ERROR1
U 1358, 0000,003C,0180,0A70,0000,1359   ;2863   PRTC3:  LAB_R[0E]
U 1359, 0000,003C,0180,52F8,0000,135A   ;2864           R[0F]_LA,MCT/READ.V.WCHK
U 135A, 0800,003C,0180,0A78,0000,135B   ;2865           D_R[0F]
U 135B, 0003,003C,0180,0AF8,0000,135C   ;2866           R[0F]_0
U 135C, 0000,003C,0180,0A70,0000,135D   ;2867           LAB_R[0E]
U 135D, 0001,003C,0180,09E0,0000,135E   ;2868           RC[0C]_D
U 135E, 001C,2000,0180,0800,0010,135F   ;2869           ALU_LA[A-B]D,CLK.UBCC
U 135F, 0000,013C,0180,C800,0000,1190   ;2870           Z?
U 1190, 0000,003C,0180,0800,0000,1360   ;2871   =0      J/PROTC4                        ; A UTRAP OCCRRUED.
U 1191, 0000,003C,0180,0800,0000,1362   ;2872           J/PROTC5                        ; NO UTRAP OCCURRED
U 1360, 0019,0034,6580,0800,0010,1361   ;2873   PROTC4: ALU_D[AND]K[.10],CLK.UBCC
U 1361, 0000,013C,0180,0800,0000,1192   ;2874           Z?
U 1192, 0000,003D,0180,0800,0000,11E0   ;2875   =0      ERROR1                          ; A NON TB ACCESS VIOLATION
                                        ;2876                                           ; UTRAP OCCURRED.
U 1193, 0000,003D,0180,0800,0000,11E0   ;2877           ERROR1                          ; A TB ACCESS VIOLATION
                                        ;2878                                           ; UTRAP OCCURRED.
U 1362, 0000,003C,0180,1000,0000,1363   ;2879   PROTC5: FS/MCT,MCT/TEST.WCHK
U 1363, 0000,1D3C,0180,0800,0000,109C   ;2880           BEN/TB.TEST
U 109C, 0000,003C,0180,0800,0000,1364   ;2881   =11100  J/PRTC5
U 109D, 0000,003D,0180,0800,0000,11E0   ;2882           ERROR1
U 109E, 0000,003D,0180,0800,0000,11E0   ;2883           ERROR1
U 109F, 0000,003D,0180,0800,0000,11E0   ;2884           ERROR1
U 1364, 0000,003E,0180,0800,0000,0001   ;2885   PRTC5:  RETURN1
                                        ;2886   ; THIS IS A SUBROUTINE USED TO TEST MODE VS ACCESS CODE COMBINATIONS
                                        ;2887   ; WHICH ALLOW READS BUT PROHIBIT WRITES.
U 1365, 0000,003C,0180,0A70,0000,1366   ;2888   PROTC6: LAB_R[0E]
U 1366, 0003,003C,0180,09D0,0000,1367   ;2889           RC[0A]_0                ; NO TRAP EXPECTED FLAG
U 1367, 0000,003C,0180,42F8,0000,1368   ;2890           R[0F]_[A,MCT/READ.V.RCHK
U 1368, 0800,003C,0180,0A78,0000,1369   ;2891           D_R[0F]
U 1369, 0003,003C,0180,0AF8,0000,136A   ;2892           R[0F]_0
U 136A, 0000,003C,0180,0A70,0000,136B   ;2893           LAB_R[0E]
U 136B, 0001,003C,0180,09E0,0000,136C   ;2894           RC[0C]_D
U 136C, 001C,2000,0180,0800,0010,136D   ;2895           ALU_LA[A-B]D,CLK.UBCC
U 136D, 0000,013C,0180,0800,0000,1194   ;2896           Z?
U 1194, 0000,003C,0180,0800,C000,136E   ;2897   =0      J/PROTC7                                ; UTRAP OCCRRED.
U 1195, 0000,003C,0180,0800,0000,1370   ;2898           J/PROTC8                        ; NO UTRAP
U 136E, 0019,0034,6580,0800,0010,136F   ;2899   PROTC7: ALU_D[AND]K[.10],CLK.UBCC
U 136F, 0000,013C,0180,0800,0000,1196   ;2900           Z?
U 1196, 0000,003D,0180,0800,0000,11E0   ;2901   =0      ERROR1                          ; A UTRAP WHICH WAS NOT AN
                                        ;2902                                           ; ACCESS VIOLATION OCCURRED.
U 1197, 0000,003D,0180,0800,0000,11E0   ;2903           ERROR1                  ; AN ACCESS VIOLATION MICRO TRAP
                                        ;2904                                           ; OCCURRED.
U 1370, 0000,003C,0180,0000,0000,1371   ;2905   PROTC8: FS/MCT,MCT/TEST.RCHK
U 1371, 000C,1D3C,0180,0800,0000,10BC   ;2906           BEN/TB.TEST
U 10BC, 0000,003C,0180,0800,0000,1372   ;2907   =11100  J/PRTC8
```

```
U 10BD, 0000,003D,0180,0800,0000,11E0   ;2908            ERROR1
U 10BE, 0000,003D,0180,0800,0000,11E0   ;2909            ERROR1
U 10BF, 0000,003D,0180,0800,0000,11E0   ;2910            ERROR1
U 1372, 0000,003C,0180,0A70,0000,1373   ;2911   PRTC8:   LAB_R[0E]
U 1373, 0018,0038,0580,09D0,0000,1374   ;2912            RC[0A]_K[.1]         ; TRAP EXPECTED FLAG
U 1374, 0000,003C,0180,52F8,0000,1375   ;2913            R[0F]_[A,MCT/READ.V.WCHK
U 1375, 0800,003C,0180,0A78,0000,1376   ;2914            D_R[0F]
U 1376, 0003,003C,0180,0AF8,0000,1377   ;2915            R[0F]_0
U 1377, 0000,003C,0180,0A70,0000,1378   ;2916            LAB_R[0E]
U 1378, 0001,003C,0180,09E0,0000,1379   ;2917            RC[0C]_D
U 1379, 001C,2000,0180,0800,0010,137A   ;2918            ALU_LA[A-B]D,CLK.UBCC
U 137A, 0000,013C,0180,0800,0000,1198   ;2919            Z?
U 1198, 0000,003C,0180,0800,0000,137B   ;2920   =0       J/PROTC9                          ; A UTRAP OCCRRUED.
U 1199, 0000,003D,0180,0800,0000,11E0   ;2921            ERROR1                            ; NO UTRAP OCCURRED
U 137B, 0019,0034,6580,0800,0010,137C   ;2922   PROTC9:  ALU_D[AND]K[.10],CLK.UBCC
U 137C, 0000,013C,0180,0800,0000,119A   ;2923            Z?
U 119A, 0000,003D,0180,0800,0000,11E0   ;2924   =0       ERROR1                            ; A NON TB ACCESS VIOLATION
                                        ;2925                                              ; UTRAP OCCURRED.
U 119B, 0000,003C,0180,0800,0000,137D   ;2926            NOP                               ; A TB ACCESS VIOLATION
                                        ;2927                                              ; UTRAP OCCURRED.
U 137D, 0000,003C,0180,1000,0000,137E   ;2928   PROTC10:          FS/MCT,MCT/TEST.WCHK
U 137E, 0000,1D3C,0180,0800,0000,10DC   ;2929            BEN/TB.TEST
U 10DC, 0000,003D,0180,0800,0000,11E0   ;2930   =11100   ERROR1
U 10DD, 0000,003D,0180,0800,0000,11E0   ;2931            ERROR1
U 10DE, 0000,003C,0180,0800,0000,137F   ;2932            J/PRTC10
U 10DF, 0000,003D,0180,0800,0000,11E0   ;2933            ERROR1
U 137F, 0000,003E,0180,0800,0000,0001   ;2934   PRTC10:  RETURN1
                                        ;2935   ; THIS IS A SUBROUTINE WHICH IS USED TO TEST MODE VS ACCESS CODE
                                        ;2936   ; COMBINATIONS WHICH PROHIBIT BOTH READS AND WRITES.
U 1380, 0000,003C,0180,0A70,0000,1381   ;2937   PROTC11:          LAB_R[0E]
U 1381, 0018,0038,0580,09D0,0000,1382   ;2938            RC[0A]_K[.1]         ; TRAP EXPECTED FLAG
U 1382, 0000,003C,0180,42F8,0000,1383   ;2939            R[0F]_[A,MCT/READ.V.RCHK
U 1383, 0800,003C,0180,0A78,0000,1384   ;2940            D_R[0F]
U 1384, 0003,003C,0180,0AF8,0000,1385   ;2941            R[0F]_0
U 1385, 0000,003C,0180,0A70,0000,1386   ;2942            LAB_R[0E]
U 1386, 0001,003C,0180,09E0,0000,1387   ;2943            RC[0C]_D
U 1387, 001C,2000,0180,0800,0010,1388   ;2944            ALU_LA[A-B]D,CLK.UBCC
U 1388, 0000,013C,0180,0800,0000,119C   ;2945            Z?
U 119C, 0000,003C,0180,0800,0000,1389   ;2946   =0       J/PROTC12                                  ; UTRAP OCCRRED.
U 119D, 0000,003D,0180,0800,0000,11E0   ;2947            ERROR1                            ; NO UTRAP
U 1389, 0019,0034,6580,0800,0010,138A   ;2948   PROTC12:          ALU_D[AND]K[.10],CLK.UBCC
U 138A, 0000,013C,0180,0800,0000,119E   ;2949            Z?
U 119E, 0000,003D,0180,0800,0000,11E0   ;2950   =0       ERROR1                            ; A UTRAP WHICH WAS NOT AN
                                        ;2951                                              ; ACCESS VIOLATION OCCURRED.
U 119F, 0000,003C,0180,0800,0000,138B   ;2952            NOP                               ; AN ACCESS VIOLATION MICRO TRAP
                                        ;2953                                              ; OCCURRED.
U 138B, 0000,003C,0180,0000,0000,138C   ;2954   PROTC13:          FS/MCT,MCT/TEST.RCHK
U 138C, 0000,1D3C,0180,0800,0000,10FC   ;2955            BEN/TB.TEST
U 10FC, 0000,003D,0180,0800,0000,11E0   ;2956   =11100   ERROR1
U 10FD, 0000,003D,0180,0800,0000,11E0   ;2957            ERROR1
U 10FE, 0000,003C,0180,0800,0000,138D   ;2958            J/PRTC13
U 10FF, 0000,003D,0180,0800,0000,11E0   ;2959            ERROR1
U 138D, 0000,003C,0180,0A70,0000,138E   ;2960   PRTC13:  LAB_R[0E]
U 138E, 0003,003C,0180,09C8,0000,138F   ;2961            RC[9]_0              ; FIRST TRAP ATTEMPT TRIED AND SUCCEEDED
U 138F, 0000,003C,0180,52F8,0000,1390   ;2962            R[0F]_LA,MCT/READ.V.WCHK
```

```
U 1390, 0800,003C,0180,0A78,0000,1391   ;2963           D_R[OF]
U 1391, 0003,003C,0180,0AF8,0000,1392   ;2964           R[OF]_0
U 1392, 0000,003C,0180,0A70,0000,1393   ;2965           LAB_R[OE]
U 1393, 0001,003C,0180,09E0,0000,1394   ;2966           RC[OC]_D
U 1394, 001C,2000,0180,0800,0010,1395   ;2967           ALU_LA[A-B]D,CLK.UBCC
U 1395, 0000,013C,0180,0800,0000,11A0   ;2968           Z?
U 11A0, 0000,003C,0180,0800,0000,1396   ;2969   =0      J/PROTC14                       ; A UTRAP OCCRRUED.
U 11A1, 0000,003D,0180,0800,0000,11E0   ;2970           ERROR1                          ; NO UTRAP OCCURRED
U 1396, 0019,0034,6580,0800,0010,1397   ;2971   PROTC14:        ALU_D[AND]K[.10],CLK.UBCC
U 1397, 0000,013C,0180,0800,0000,11A2   ;2972           Z?
U 11A2, 0000,003D,0180,0800,0000,11E0   ;2973   =0      ERROR1                          ; A NON TB ACCESS VIOLATION
                                        ;2974                                           ; UTRAP OCCURRED.
U 11A3, 0000,003C,0180,0800,0000,1398   ;2975           NOP                                     ; A TB ACCESS VIOLATION
                                        ;2976                                           ; UTRAP OCCURRED.
U 1398, 0000,003C,0180,1000,0000,1399   ;2977   PROTC15:        FS/MCT,MCT/TEST.WCHK
U 1399, 0000,1D3C,0180,0800,0000,111C   ;2978           BEN/TB.TEST
U 111C, 0000,003D,0180,0800,0000,11E0   ;2979   =11100  ERROR1
U 111D, 0000,003D,0180,0800,0000,11E0   ;2980           ERROR1
U 111E, 0000,003C,0180,0800,0000,139A   ;2981           J/PRTC15
U 111F, 0000,003D,0180,0800,0000,11E0   ;2982           ERROR1
U 139A, 0000,003E,0180,0800,0000,0001   ;2983   PRTC15: RETURN1
                                        ;2984   =0000
U 1020, 0000,003C,0180,0800,0000,1380   ;2985   PRT1:   J/PROTC11                       ; PROT CODE=0
U 1021, 0000,003E,0180,0800,0000,0001   ;2986           RETURN1                         ;       =1
U 1022, 0000,193C,0180,0800,0000,1004   ;2987           J/PRTBA,D3-0?                   ;       =2
U 1023, 0000,193C,0180,0800,0000,1010   ;2988           J/PRTBB,D3-0?                   ;       =3
U 1024, 0000,003C,0180,0800,0000,134B   ;2989           J/PROTC1                        ;       =4
U 1025, 0000,193C,0180,0800,0000,1018   ;2990           J/PRTBC,D3-0?                   ;       =5
U 1026, 0000,193C,0180,0800,0000,1030   ;2991           J/PRTBD,D3-0?                   ;       =6
U 1027, 0000,193C,0180,0800,0000,1038   ;2992           J/PRTBE,D3-0?                   ;       =7
U 1028, 0000,193C,0180,0800,0000,1048   ;2993           J/PRTBF,D3-0?                   ;       =8
U 1029, 0000,193C,0180,0800,0000,1060   ;2994           J/PRTBG,D3-0?                   ;       =9
U 102A, 0000,193C,0180,0800,0000,1064   ;2995           J/PRTBH,D3-0?                   ;       =A
U 102B, 0000,193C,0180,0800,0000,1068   ;2996           J/PRTBI,D3-0?                   ;       =B
U 102C, 0000,193C,0180,0800,0000,106C   ;2997           J/PRTBJ,D3-0?                   ;       =C
U 102D, 0000,193C,0180,0800,0000,1070   ;2998           J/PRTBK,D3-0?                   ;       =D
U 102E, 0000,193C,0180,0800,0000,1074   ;2999           J/PRTBL,D3-0?                   ;       =E
U 102F, 0000,003C,0180,0800,0000,1365   ;3000           J/PROTC6                        ;       =F
                                        ;3001   =00
U 1004, 0000,003C,0180,0800,0000,134B   ;3002   PRTBA:  J/PROTC1
U 1005, 0000,003C,0180,0800,0000,1380   ;3003           J/PROTC11
U 1006, 0000,003C,0180,0800,0000,1380   ;3004           J/PROTC11
U 1007, 0000,003C,0180,0800,0000,1380   ;3005           J/PROTC11
                                        ;3006   =00
U 1010, 0000,003C,0180,0800,0000,1365   ;3007   PRTBB:  J/PROTC6
U 1011, 0000,003C,0180,0800,0000,1380   ;3008           J/PROTC11
U 1012, 0000,003C,0180,0800,0000,1380   ;3009           J/PROTC11
U 1013, 0000,003C,0180,0800,0000,1380   ;3010           J/PROTC11
                                        ;3011   =00
U 1018, 0000,003C,0180,0800,0000,134B   ;3012   PRTBC:  J/PROTC1
U 1019, 0000,003C,0180,0800,0000,134B   ;3013           J/PROTC1
U 101A, 0000,003C,0180,0800,0000,1380   ;3014           J/PROTC11
U 101B, 0000,003C,0180,0800,0000,1380   ;3015           J/PROTC11
                                        ;3016   =00
U 1030, 0000,003C,0180,0800,0000,134B   ;3017   PRTBD:  J/PROTC1
```

```
U 1031, 0000,003C,0180,0800,0000,1365   ;3018           J/PROTC6
U 1032, 0000,003C,0180,0800,0000,1380   ;3019           J/PROTC11
U 1033, 0000,003C,0180,0800,0000,1380   ;3020           J/PROTC11
                                        ;3021   =00
U 1038, 0000,003C,0180,0800,0000,1365   ;3022   PRTBE:  J/PROTC6
U 1039, 0000,003C,0180,0800,0000,1365   ;3023           J/PROTC6
U 103A, 0000,003C,0180,0800,0000,1380   ;3024           J/PROTC11
U 103B, 0000,003C,0180,0800,0000,1380   ;3025           J/PROTC11
                                        ;3026   =00
U 1048, 0000,003C,0180,0800,0000,134B   ;3027   PRTBF:  J/PROTC1
U 1049, 0000,003C,0180,0800,0000,134B   ;3028           J/PROTC1
U 104A, 0000,003C,0180,0800,0000,134B   ;3029           J/PROTC1
U 104B, 0000,003C,0180,0800,0000,1380   ;3030           J/PROTC11
                                        ;3031   =00
U 1060, 0000,003C,0180,0800,0000,134B   ;3032   PRTBG:  J/PROTC1
U 1061, 0000,003C,0180,0800,0000,134B   ;3033           J/PROTC1
U 1062, 0000,003C,0180,0800,0000,1365   ;3034           J/PROTC6
U 1063, 0000,003C,0180,0800,0000,1380   ;3035           J/PROTC11
                                        ;3036   =00
U 1064, 0000,003C,0180,0800,0000,134B   ;3037   PRTBH:  J/PROTC1
U 1065, 0000,003C,0180,0800,0000,1365   ;3038           J/PROTC6
U 1066, 0000,003C,0180,0800,0000,1365   ;3039           J/PROTC6
U 1067, 0000,003C,0180,0800,0000,1380   ;3040           J/PROTC11
                                        ;3041   =00
U 1068, 0000,003C,0180,0800,0000,1365   ;3042   PRTBI:  J/PROTC6
U 1069, 0000,003C,0180,0800,0000,1365   ;3043           J/PROTC6
U 106A, 0000,003C,0180,0800,0000,1365   ;3044           J/PROTC6
U 106B, 0000,003C,0180,0800,0000,1380   ;3045           J/PROTC11
                                        ;3046   =00
U 106C, 0000,003C,0180,0800,0000,134B   ;3047   PRTBJ:  J/PROTC1
U 106D, 0000,003C,0180,0800,0000,134B   ;3048           J/PROTC1
U 106E, 0000,003C,0180,0800,0000,134B   ;3049           J/PROTC1
U 106F, 0000,003C,0180,0800,0000,1365   ;3050           J/PROTC6
                                        ;3051   =00
U 1070, 0000,003C,0180,0800,0000,134B   ;3052   PRTBK:  J/PROTC1
U 1071, 0000,003C,0180,0800,0000,134B   ;3053           J/PROTC1
U 1072, 0000,003C,0180,0800,0000,1365   ;3054           J/PROTC6
U 1073, 0000,003C,0180,0800,0000,1365   ;3055           J/PROTC6
                                        ;3056   =00
U 1074, 0000,003C,0180,0800,0000,134B   ;3057   PRTBL:  J/PROTC1
U 1075, 0000,003C,0180,0800,0000,1365   ;3058           J/PROTC6
U 1076, 0000,003C,0180,0800,0000,1365   ;3059           J/PROTC6
U 1077, 0000,003C,0180,0800,0000,1365   ;3060           J/PROTC6
U 139B, 0000,003C,0180,0800,0000,11A4   ;3061   PROTDN: NOP
```

```
                                                  .PAGE   "TEST B1        IPA REGISTER TEST"
                                          ;*****************************************************************
                                          ;++
                                          ; TEST  B1      IPA REGISTER TEST
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS IS A TEST OF THE ADDRESS PATH FROM THE VAMX,
                                          ;       THROUGH THE IPA MUX, INTO THE IPA AND FROM THE
                                          ;       IPA THROUGH THE PAMUX ONTO THE PA BUS. THIS IS DONE
                                          ;       BY EXECUTING A READ.V.NEWPC WITH MME DEASSERTED
                                          ;       THEREBY LOADING THE VA INTO THE IPA. THE AN ALLOW
                                          ;       IBUF READ IS EXECUTED AND THE RESULT IS PICKED UP
                                          ;       IN THE TIME OUT ADDRES REGISTER. NOTE THAT THE
                                          ;       IBUF IS STOPPED DURING THE TEST.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       EXPECTED IPA (ADDRESS BITS JUSTIFIED TO THEIR PROPER POSITIONS)
                                          ;       GOT IPA
                                          ;
                                          ;--
                                          ;*****************************************************************
                                          =0
U 11A4, 0000,003D,0180,0800,0000,11CC     PIBA:   NEWTST
U 11A5, 0F00,003C,0180,0800,0000,11A6             D_0
U 11A6, 0000,003D,4980,3C00,0000,11E9     =0      ID[TBERO]_D,CALL,J/CSOFF
U 11A7, 081B,0000,0580,0800,0000,139C             ALU_0-K[.1],D_ALU
U 139C, 0200,003C,0180,0800,0000,139D             D_D.RIGHT2,SI/ZERO
U 139D, 0019,0024,0D80,0AC0,0000,139E             ALU_D[ANDNOT]K[.3],R[8]_ALU
U 139E, 0018,0038,ED80,0AA0,0000,139F             R[4]_K[.1B]
U 139F, 0003,003C,0180,0AF8,0000,13A0             R[OF]_0
U 13A0, 0018,0038,0980,09F8,0000,11A8             RC[OF]_K[.2]
U 11A8, 0000,003D,0180,0800,0000,11DF     =0      ERLOOP
U 11A9, 0018,0014,0980,0A20,0082,13A1     PIBA1:  LAB_R[4],ALU_LA+K[.2],SC_ALU
U 13A1, 0003,001C,0180,09F0,0200,13A2             ALU_NOT.MASK,VA_ALU,RC[OE]_ALU
U 13A2, 0018,0038,1980,6000,0200,13A3             VA_K[ZERO],FS/MCT,MCT/READ.V.NEWPC
U 13A3, 0000,003C,0180,F800,0000,13A4             FS/MCT,MCT/ALLOW.IB.READ
U 13A4, 0000,003C,69F0,2C00,0000,13A5             Q_ID[TIME.ADDR]
U 13A5, 0000,003C,0188,0800,0000,13A6             Q_Q.LEFT2,SI/ZERO
U 13A6, 0000,003C,01A8,0800,0000,13A7             Q_Q.LEFT,SI/ZERO
U 13A7, 0000,003C,0180,0800,0000,13A8             Q_Q.RIGHT,SI/ZERO
U 13A8, 0810,0038,0180,0970,0000,13A9             D_RC[OE]
U 13A9, 0001,203C,0180,09E8,0000,13AA             RC[OD]_Q
U 13AA, 001D,2000,0180,0800,0010,13AB             ALU_Q-D,CLK.UBCC
U 13AB, 0000,013C,0180,0800,0000,11AA             Z?
U 11AA, 0000,003D,0180,0800,0000,11E0     =0      ERROR1
U 11AB, 0800,003C,0180,0A40,0000,13AC             D_R[8]
U 13AC, 0001,0034,0180,09F0,0200,13AD             ALU_D.AND.MASK,VA_ALU,RC[OE]_ALU
U 13AD, 0018,0038,1980,6000,0200,13AE             VA_K[ZERO],FS/MCT,MCT/READ.V.NEWPC
U 13AE, 0000,003C,0180,F800,0000,13AF             FS/MCT,MCT/ALLOW.IB.READ
U 13AF, 0000,003C,69F0,2C00,0000,13B0             Q_ID[TIME.ADDR]
U 13B0, 0000,003C,0188,0800,0000,13B1             Q_Q.LEFT2,SI/ZERO
U 13B1, 0000,003C,01A8,0800,0000,13B2             Q_Q.LEFT,SI/ZERO
U 13B2, 0000,003C,0180,0800,0000,13B3             Q_Q.RIGHT,SI/ZERO
U 13B3, 0810,0038,0180,0970,0000,13B4             D_RC[OE]
U 13B4, 0001,203C,0180,09E8,0000,13B5             RC[OD]_Q
```

```
U 13B5, 001D,2000,0180,0800,0010,13B6   ;3117           ALU_Q-D,CLK.UBCC
U 13B6, 0000,013C,0180,0800,0000,11AC   ;3118           Z?
U 11AC, 0000,003D,0180,0800,0000,11E0   ;3119   =0      ERROR1
U 11AD, 0000,003C,0180,0A20,0010,13B7   ;3120           ALU_R[4],CLK.UBCC
U 13B7, 0000,013C,0180,0800,0000,11AE   ;3121           Z?
U 11AE, 0018,0000,0580,0AA0,0000,11A9   ;3122   =0      R[4]_LA-K[.1],J/PIBA1
U 11AF, 0000,003C,0180,0800,0000,11B0   ;3123           NOP
```

```
                                        ;3124           .PAGE   "TEST B2        READ.V.NEWPC, HIT IN GROUP 0, TEST"
                                        ;3125   ;*****************************************************************
                                        ;3126   ;++
                                        ;3127   ; TEST  B2      READ.V.NEWPC, HIT IN GROUP 0, TEST
                                        ;3128   ;
                                        ;3129   ; TEST DESCRIPTION
                                        ;3130   ;       THIS IS A TEST OF A READ.V.NEWPC WITH THE VA
                                        ;3131   ;       BEING A HIT IN GROUP 0.
                                        ;3132   ;       THIS TESTS THE GROUP ZERO INPUTS TO THE IPA MUX.
                                        ;3133   ;
                                        ;3134   ; ERROR DESCRIPTION
                                        ;3135   ;       EXPECTED IPA (AS IT APPEARS IN THE TIME OUT ADDRESS REGISTER)
                                        ;3136   ;       ACTUAL IPA (AS IN TIME OUT ADDRESS REGISTER)
                                        ;3137   ;       VA
                                        ;3138   ;       PTE WRITTEN INTO GROUP 0
                                        ;3139   ;
                                        ;3140   ;--
                                        ;3141   ;*****************************************************************
                                        ;3142   =0
U 11B0, 0018,0039,1180,09F8,0000,11CC   ;3143   HOPIBA: NEWTST[.4]
U 11B1, 0003,003C,0180,0AF0,0000,11B2   ;3144           R[OE]_0
U 11B2, 0003,003D,0180,0AF8,0000,11E9   ;3145   =0      R[OF]_0,CALL,J/CSOFF
U 11B3, 0003,003C,0180,0AF8,0000,11B4   ;3146           R[OF]_0
U 11B4, 0000,003D,0180,0800,0000,1243   ;3147   =0      CALL,J/TBWPTP
U 11B5, 0018,0038,2180,0AA0,0000,11B6   ;3148           R[4]_K[.14]
U 11B6, 0000,003D,0180,0800,0000,11DF   ;3149   =0      ERLOOP
U 11B7, 0010,0038,0180,0908,0200,13B8   ;3150   HOPIBB: VA_RC[1]
U 13B8, 0000,003C,0180,0900,0000,11B8   ;3151           LC_RC[0]
U 11B8, 0010,0039,0180,0AC0,0000,107A   ;3152   =0      R[8]_LC,CALL,J/TBWRB
U 11B9, 0000,003C,0180,0A20,0082,13B9   ;3153           SC_R[4]
U 13B9, 0000,003C,01C0,0A60,0000,13BA   ;3154           Q_R[OC]
U 13BA, 0001,201C,01C0,0800,0000,13BB   ;3155           ALU_Q.ORNOT.MASK,Q_ALU
U 13BB, 0010,0038,0180,0938,0200,13BC   ;3156           VA_RC[7]
U 13BC, 0010,0038,0180,09E0,0000,13BD   ;3157           RC[OC]_LC
U 13BD, 0010,0038,0180,0AA8,0000,11BA   ;3158           R[5]_LC
U 11BA, 0001,203D,0180,0AB0,0000,1080   ;3159   =0      R[6]_Q,CALL,J/RELSUB
U 11BB, 0000,003C,01C0,0A30,0000,13BE   ;3160           Q_R[6]
U 13BE, 0001,203C,0180,09D8,0000,11BC   ;3161           RC[OB]_Q
U 11BC, 0001,203D,0180,0AC0,0000,1078   ;3162   =0      R[8]_Q,CALL,J/TBWRO
U 11BD, 0000,003C,0180,6000,0000,13BF   ;3163           FS/MCT,MCT/READ.V.NEWPC
U 13BF, 0010,0038,0180,0908,0200,13C0   ;3164           VA_RC[1]
U 13C0, 0000,003C,0180,F800,0000,13C1   ;3165           FS7MCT,MCT/ALLOW.IB.READ
U 13C1, 0000,003C,69F0,2C00,0000,13C2   ;3166           Q_ID[TIME.ADDR]
U 13C2, 0000,003C,ED80,0800,0084,73C3   ;3167           SC_K[.1B]
U 13C3, 0000,003C,0580,0800,0084,93C4   ;3168           SC_SC+K[.1]
U 13C4, 0803,0010,0180,0800,0000,13C5   ;3169           ALU_MASK+1,D_ALU
U 13C5, 001D,2024,01C0,09E8,0000,13C6   ;3170           ALU_Q[ANDNOT]D,Q_ALU,RC[OD]_ALU
U 13C6, 0800,003C,0180,0A38,0000,13C7   ;3171           D_R[7]
U 13C7, 001D,2000,0180,0800,0010,13C8   ;3172           ALU_Q-D,CLK.UBCC
U 13C8, 0001,013C,0180,09F0,0000,11BE   ;3173           RC[OE]_D,Z?
U 11BE, 0000,003D,0180,0800,0000,11E0   ;3174   =0      ERROR1
U 11BF, 0010,0038,0180,0938,0200,13C9   ;3175           VA_RC[7]
U 13C9, 0010,0038,0180,09E0,0000,13CA   ;3176           RC[OC]_LC
U 13CA, 0000,003C,0180,0A20,0082,13CB   ;3177           SC_R[4]
U 13CB, 0000,003C,01C0,0A68,0000,13CC   ;3178           Q_R[OD]
```

```
U 13CC, 0001,2034,01C0,0A60,0000,11C0   ;3179            ALU_Q.AND.MASK,Q_ALU,LAB_R[0C]
U 11C0, 001C,0031,01C0,0AB0,0000,1080   ;3180   =0       ALU_LA[OR]Q,Q_ALU,R[6]_ALU,CALL,J/RELSUB
U 11C1, 0000,003C,01C0,0A30,0000,13CD   ;3181            Q_R[6]
U 13CD, 0001,203C,0180,09D8,0000,11C2   ;3182            RC[0B]_Q
U 11C2, 0001,203D,0180,0AC0,0000,1078   ;3183   =0       R[8]_Q,CALL,J/TBWR0
U 11C3, 0000,003C,0180,6000,0000,13CE   ;3184            FS/MCT,MCT/READ.V.NEWPC
U 13CE, 0010,0038,0180,0908,0200,13CF   ;3185            VA_RC[1]
U 13CF, 0000,003C,0180,F800,0000,13D0   ;3186            FS/MCT,MCT/ALLOW.IB.READ
U 13D0, 0000,003C,69F0,2C00,0000,13D1   ;3187            Q_ID[TIME.ADDR]
U 13D1, 0000,003C,ED80,0800,0084,73D2   ;3188            SC_K[.1B]
U 13D2, 0000,003C,0580,0800,0084,93D3   ;3189            SC_SC+K[.1]
U 13D3, 0803,0010,0180,0800,0000,13D4   ;3190            ALU_MASK+1,D_ALU
U 13D4, 001D,2024,01C0,09E8,0000,13D5   ;3191            ALU_G[ANDNOT]D,Q_ALU,RC[0D]_ALU
U 13D5, 0800,003C,0180,0A38,0000,13D6   ;3192            D_R[7]
U 13D6, 001D,2000,0180,0800,0010,13D7   ;3193            ALU_Q-D,CLK.UBCC
U 13D7, 0001,013C,0180,09F0,0000,11C4   ;3194            Z?,RC[0E]_D
U 11C4, 0000,003D,0180,0800,0000,11E0   ;3195   =0       ERROR1
                                        ;3196   ; SEE IF GROUP 1 IS INTACT.
U 11C5, 0018,0038,D580,09F8,0000,13D8   ;3197            RC[0F]_K[.6]
U 13D8, 0010,0038,0180,0908,0200,13D9   ;3198            VA_RC[1]
U 13D9, 0010,0038,0180,09D0,0000,13DA   ;3199            RC[0A]_LC
U 13DA, 0000,003C,0180,0910,0000,1050   ;3200            LC_RC[2]
U 1050, 0010,0039,0180,0AB8,0000,1226   ;3201   =000     R[7]_LC,CALL,J/HIT1
U 1051, 0000,003D,0180,0800,0000,11E0   ;3202            ERROR1
U 1052, 0000,003D,0180,0800,0000,11E0   ;3203            ERROR1
U 1053, 0000,003D,0180,0800,0000,11E0   ;3204            ERROR1
U 1054, 0000,003D,0180,0800,0000,11F9   ;3205            CALL,J/RELCHK
U 1055, 0000,003D,0180,0800,0000,11E0   ;3206            ERROR1
U 1056, 0000,003D,0180,0800,0000,11E0   ;3207            ERROR1
U 1057, 0000,003C,0180,0A20,0010,13DB   ;3208            ALU_R[4],CLK.UBCC
U 13DB, 0000,013C,0180,0800,0000,11C6   ;3209            Z?
U 11C6, 0018,0000,0580,0AA0,0000,11B7   ;3210   =0       R[4]_LA-K[.1],J/HCPIBB
U 11C7, 0000,003C,0180,0800,0000,13DC   ;3211            NOP
U 13DC, 0000,003D,0180,0800,0000,11CC   ;3212   DUMMY:   NEWTST
```

```
;                             Location / Line Number Index

;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000           1871:    1838     1845=    1861=    3002=    3003=    3004=    3005=
U 1008           2780=    2781=    2782=    2783=    2784=    2785=    2786=    2787=
U 1010           3007=    3008=    3009=    3010=    1862=    1863=    1839     2301=
U 1018           3012=    3013=    3014=    3015=    1951=    1952=    1840     2302=
U 1020           2985=    2986=    2987=    2988=    2989=    2990=    2991=    2992=
U 1028           2993=    2994=    2995=    2996=    2997=    2998=    2999=    3000=
U 1030           3017=    3018=    3019=    3020=    1970=    1971=    1841     2329=
U 1038           3022=    3023=    3024=    3025=    1972=    1973=    1842     2330=
U 1040           2829=    2830=    2831=    2832=    2833=    2834=    2835=    2836=
U 1048           3027=    3028=    3029=    3030=    1982=    1983=    1902:    1843
U 1050           3201=    3202=    3203=    3204=    3205=    3206=    3207=    3208=
U 1058           1984=    1985=    1905:    1844     1986=    1987=    1908:    1864
U 1060           3032=    3033=    3034=    3035=    3037=    3038=    3039=    3040=
U 1068           3042=    3043=    3044=    3045=    3047=    3048=    3049=    3050=
U 1070           3052=    3053=    3054=    3055=    3057=    3058=    3059=    3060=
U 1078           1992=    1993=    1996=    1997=    2859=    2860=    2861=    2862=
U 1080           2006=    2007=    2008=    2009=    2025=    2026=    2027=    2028=
U 1088           2037=    2038=    2053=    2054=    2058=    2059=    2075=    2076=
U 1090           2078=    2079=    2083=    2084=    2111=    2112=    2114=    2115=
U 1098           2117=    2118=    2121=    2122=    2881=    2882=    2883=    2884=
U 10A0           2124=    2125=    2127=    2128=    2131=    2132=    2135=    2136=
U 10A8           2175=    2176=    2180=    2181=    2183=    2184=    2185=    2186=
U 10B0           2190=    2191=    2193=    2194=    2195=    2196=    2200=    2201=
U 10B8           2203=    2204=    2205=    2206=    2907=    2908=    2909=    2910=
U 10C0           2210=    2211=    2213=    2214=    2267=    2268=    2270=    2271=
U 10C8           2272=    2273=    2280=    2281=    2282=    2283=    2293=    2294=
U 10D0           2297=    2298=    2308=    2309=    2310=    2311=    2321=    2322=
U 10D8           2325=    2326=    2337=    2338=    2930=    2931=    2932=    2933=
U 10E0           2339=    2340=    2350=    2351=    2354=    2355=    2362=    2363=
U 10E8           2364=    2365=    2375=    2376=    2379=    2380=    2386=    2387=
U 10F0           2388=    2389=    2399=    2400=    2403=    2404=    2409=    2410=
U 10F8           2411=    2412=    2422=    2423=    2[illegible]6=    2957=    2958=    2959=
U 1100           1825:    1826:    1827:    1828:    1829:    1830:    1831:    1832:
U 1108           1833:    1865     2426=    2427=    1834:    1835:    1836:    1837:
U 1110           2432=    2433=    2434=    2435=    2445=    2446=    2449=    2450=
U 1118           2476=    2477=    2478=    2479=    2979=    2980=    2981=    2982=
U 1120           2486=    2487=    2489=    2490=    2491=    2492=    2493=    2494=
U 1128           2500=    2501=    2503=    2504=    2516=    2517=    2520=    2521=
U 1130           2524=    2525=    2535=    2536=    2539=    2540=    2543=    2544=
U 1138           2570=    2571=    2572=    2573=    2579=    2580=    2582=    2583=
U 1140           2584=    2585=    2586=    2587=    2593=    2594=    2604=    2605=
U 1148           2608=    2609=    2612=    2613=    2623=    2624=    2627=    2628=
U 1150           2631=    2632=    2657=    2658=    1866     1928:    2659=    2660=
U 1158           2661=    2662=    2663=    2664=    2677=    2678=    2681=    2682=
U 1160           2685=    2687=    2726=    2727=    2728=    2729=    2730=    2731=
U 1168           2733=    2734=    2737=    2738=    2741=    2742=    2743=    2744=
U 1170           2746=    2747=    2759=    2760=    2766=    2767=    2770=    2771=
U 1178           2776=    2777=    2788=    2789=    2219:    2220:    2221:    2222:
U 1180           2792=    2793=    2795=    2796=    2808=    2809=    2815=    2816=
U 1188           2819=    2820=    2825=    2826=    2849=    2850=    2853=    2855=
U 1190           2871=    2872=    2875=    2877=    2897=    2898=    2901=    2903=
U 1198           2920=    2921=    2924=    2926=    2946=    2947=    2950=    2952=
;Location       0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0          2969=   2970=   2973=   2975=   3084=   3085=   3086=   3087=
U 11A8          3093=   3094=   3106=   3107=   3119=   3120=   3122=   3123=
U 11B0          3143=   3144=   3145=   3146=   3147=   3148=   3149=   3150=
U 11B8          3152=   3153=   3159=   3160=   3162=   3163=   3174=   3175=
U 11C0          3180=   3181=   3183=   3184=   3195=   3197=   3210=   3211=
U 11C8          1867    1868    1869    1870    1880    1881    1882    1883
U 11D0          1884    1885    1886    1887    1888    1889    1890    1891
U 11D8          1892    1893    1894    1895    1896    1897    1898    1899
U 11E0          1900    1901    1903    1904    1936    1937    1943    1944
U 11E8          1945    1950    1953    1954    1957    1958    1959    1960
U 11F0          1963    1964    1965    1988    1989    1999    2010    2011
U 11F8          2012    2018    2019    2020    2223:   2224:   2225:   2226:
U 1200          2021    2022    2023    2024    2029    2030    2031    2032
U 1208          2033    2034    2035    2036    2039    2040    2045    2046
U 1210          2047    2048    2049    2050    2051    2052    2055    2056
U 1218          2057    2066    2067    2068    2069    2070    2071    2072
U 1220          2073    2074    2077    2080    2081    2082    2086    2088
U 1228          2089    2090    2091    2092    2093    2094    2095    2096
U 1230          2097    2098    2099    2100    2101    2102    2103    2104
U 1238          2105    2106    2107    2108    2109    2113    2119    2123
U 1240          2129    2133    2137    2163    2164    2165    2166    2167
U 1248          2168    2169    2170    2171    2172    2173    2174    2177
U 1250          2178    2179    2182    2187    2188    2189    2192    2197
U 1258          2198    2199    2202    2207    2208    2209    2212    2218
U 1260          2269    2284    2285    2286    2287    2288    2289    2290
U 1268          2291    2292    2295    2296    2299    2300    2312    2313
U 1270          2314    2315    2316    2317    2318    2319    2320    2323
U 1278          2324    2327    2328    2341    2342    2343    2344    2345
U 1280          2346    2347    2348    2349    2352    2353    2366    2367
U 1288          2368    2369    2370    2371    2372    2373    2374    2377
U 1290          2378    2390    2391    2392    2393    2394    2395    2396
U 1298          2397    2398    2401    2402    2413    2414    2415    2416
U 12A0          2417    2418    2419    2420    2421    2424    2425    2436
U 12A8          2437    2438    1929:   2439    2440    2441    2442    2443
U 12B0          2444    2447    2448    2480    2481    2482    2483    2484
U 12B8          2485    2488    2495    2496    2497    2498    2499    2502
U 12C0          2505    2506    2507    2508    2509    2510    2511    2512
U 12C8          2513    2514    2515    2518    2519    2522    2523    2526
U 12D0          2527    2528    2529    2530    2531    2532    2533    2534
U 12D8          2537    2538    2541    2542    2574    2575    2576    2577
U 12E0          2578    2581    2588    2589    2590    2591    2592    2595
U 12E8          2596    2597    2598    2599    2600    2601    2602    2603
U 12F0          2606    2607    2610    2611    2614    2615    2616    2617
U 12F8          2618    2619    2620    2621    2622    2625    2626    2629
U 1300          2630    2665    2666    2667    2668    2669    2670    2671
U 1308          2672    2673    2674    2675    2676    2679    2680    2683
U 1310          2684    2732    2735    2736    2739    2740    2745    2748
U 1318          2749    2750    2751    2752    2753    2754    2755    2756
U 1320          2757    2758    2761    2762    2763    2764    2765    2768
U 1328          2769    2772    2773    2774    2775    2778    2779    2790
U 1330          2791    2794    2797    2798    2799    2800    2801    2802
U 1338          2803    2804    2805    2806    2807    2810    2811    2812
U 1340          2813    2814    2817    2818    2821    2822    2823    2824
```

```
;Location         0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 1348            2827     2828     2837     2840     2841     2842     2843     2844
U 1350            2845     2846     2847     2848     2851     2852     2857     2858
U 1358            2863     2864     2865     2866     2867     2868     2869     2870
U 1360            2873     2874     2879     2880     2885     2888     2889     2890
U 1368            2891     2892     2893     2894     2895     2896     2899     2900
U 1370            2905     2906     2911     2912     2913     2914     2915     2916
U 1378            2917     2918     2919     2922     2923     2928     2929     2934
U 1380            2937     2938     2939     2940     2941     2942     2943     2944
U 1388            2945     2948     2949     2954     2955     2960     2961     2962
U 1390            2963     2964     2965     2966     2967     2968     2971     2972
U 1398            2977     2978     2983     3061     3088     3089     3090     3091
U 13A0            3092     3095     3096     3097     3098     3099     3100     3101
U 13A8            3102     3103     3104     3105     3108     3109     3110     3111
U 13B0            3112     3113     3114     3115     3116     3117     3118     3121
U 13B8            3151     3154     3155     3156     3157     3158     3161     3164
U 13C0            3165     3166     3167     3168     3169     3170     3171     3172
U 13C8            3173     3176     3177     3178     3179     3182     3185     3186
U 13D0            3187     3188     3189     3190     3191     3192     3193     3194
U 13D8            3198     3199     3200     3209     3212
U 13E0 - 13EF Unused
U 13F0            1912:    1913:    1914:    1915:    1916:    1917:    1918:    1919:
U 13F8            1920:    1921:    1922:    1923:    1924:    1925:    1926:    1927:
```

```
          Words not
          in bounds
 ESK00DEF         0
 ESK00MAC         0
 ESKAHMAC         0
  ESKAH29      1005

Used           1005
Remaining

Total microwords used in memory U: 1005
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
U
U
U
U

U
U

U
U
U
```

```
; The files used in this assembly are:
ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH29.MIC

Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 1806  MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2312  TEST B3 READ.V.NEWPC, HIT IN GROUP 1, TEST
; 2404  TEST B4 TB GROUP 0 PTE MEMORY STATIC TEST
; 2484  TEST B5 TB GROUP 1 PTE MEMORY STATIC TEST
; 2564  TEST B6 TB GROUP 0 TAG MEMORY STATIC TEST
; 2642  TEST B7 TB GROUP 1 TAG MEMORY STATIC TEST
; 2721  TEST B8 DUAL ADDRESSING TEST OF TRANSLATION BUFFER ADDRESS MATRIX
; 2812  TEST B9 DUAL ADDRESSING TEST OF TRANSLATION BUFFER DATA MATRIX
; 2974  TEST BA DYNAMIC MEMORY TEST OF TB ADDRESS MEMORY
; 3130  TEST BB DYNAMIC MEMORY TEST OF TB DATA MEMORY (PTE'S)
```

```
;1      .NOLIST
;1804   .LIST
;1805
```

```
                                        ;1806          .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                        ;1807   .REGION/1000,13FF
                                        ;1808   ;+
                                        ;1809   ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                        ;1810   ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                        ;1811   ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                        ;1812   ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                        ;1813   ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                        ;1814   ;
                                        ;1815   ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                        ;1816   ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                        ;1817   ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                        ;1818   ;       R[OF] AND DO A RETURNO.
                                        ;1819   ;
                                        ;1820   ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                        ;1821   ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                        ;1822   ; TO THE CONSOLE.
                                        ;1823   ;
                                        ;1824   ;-
U 1100, 0000,003C,1980,0800,0084,7003   ;1825   1100:   SC_K[ZERO],J/TRPH1        ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001   ;1826   1101:   SC_K[.1],J/TRPHO          ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001   ;1827   1102:   SC_K[.2],J/TRPHO          ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001   ;1828   1103:   SC_K[.3],J/TRPHO          ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001   ;1829   1104:   SC_K[.4],J/TRPHO          ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001   ;1830   1105:   SC_K[.6],J/TRPHO          ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001   ;1831   1106:   SC_K[.9],J/TRPHO          ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001   ;1832   1107:   SC_K[.7],J/TRPHO          ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001   ;1833   1108:   SC_K[.8],J/TRPHO          ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003   ;1834   110C:   SC_K[.C],J/TRPH1          ; RDS
U 110D, 0000,003C,8980,0800,0084,7003   ;1835   110D:   SC_K[.D],J/TRPH1          ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001   ;1836   110E:   SC_K[.10],J/TRPHO         ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003   ;1837   110F:   SC_K[.F],J/TRPH1          ; CS PARITY
U 1001, 0000,003C,01C0,0A78,0000,1006   ;1838   TRPHO:  Q_R[OF]
U 1006, 0001,2024,0180,0800,0010,100E   ;1839           ALU_Q.ANDNOT.MASK,CLK.UBCC        ; WAS TRAP EXPECTED?
U 100E, 0000,013C,0180,0800,0000,1002   ;1840           Z?                                ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000   ;1841   =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN
                                        ;1842   ;+
                                        ;1843   ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                        ;1844   ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                        ;1845   ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                        ;1846   ;
                                        ;1847   ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                        ;1848   ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                        ;1849   ;             FAULT STATUS REGISTER
                                        ;1850   ;             SBI ERROR REGISTER
                                        ;1851   ;             TIMEOUT ADDRESS REGISTER
                                        ;1852   ;             MAINTENANCE REGISTER
                                        ;1853   ;             CACHE PARITY REGISTER
                                        ;1854   ;             TB ERROR REGISTER 1
                                        ;1855   ;             TB ERROR REGISTER 0
                                        ;1856   ;-
U 1003, 0018,0038,1D80,09E8,0000,1004   ;1857   TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,7190   ;1858   =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,1016   ;1859           Q_ID[TBER0]
U 1016, 0001,203C,4DF0,2D80,0000,101E   ;1860           RC[6]_Q,Q_ID[TBER1]
```

```
U 101E, 0001,203C,65F0,2DB8,0000,1026    ;1861              RC[7]_Q,Q_ID[SBI.ERR]
U 1026, 0001,203C,6DF0,2DD8,0000,102E    ;1862              RC[0B]_Q,Q_ID[FAULT]
U 102E, 0001,203C,75F0,2DE0,0000,1036    ;1863              RC[0C]_Q,Q_ID[MAINT]
U 1036, 0001,203C,79F0,2DC8,0000,103E    ;1864              RC[9]_Q,Q_ID[PARITY]
U 103E, 0001,203C,69F0,2DC0,0000,104F    ;1865              RC[8]_Q,Q_ID[TIME.ADDR]
U 104F, 0001,203C,81F0,2DD0,0000,1000    ;1866              RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,118A    ;1867    1000:     RC[0E]_Q,ERROR1
                                         ;1868    ;+
                                         ;1869    ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                         ;1870    ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                         ;1871    ;                   NEWTST
                                         ;1872    ;                   ERLOOP
                                         ;1873    ;                   ERROR1
                                         ;1874    ;                   ERROR2
                                         ;1875    ;
U 105B, 0000,003C,65F8,0800,0084,705F    ;1876    SCOPE:    SC_K[.10],Q_0                ; SETUP TO WRITE IPL OF 1F
U 105F, 0818,0038,8D80,0800,0000,1109    ;1877              D_K[.1F]                     ; ...
U 1109, 0D00,003C,0180,0800,0000,1154    ;1878              D_DAL.SC
U 1154, 0000,003C,3D80,3C00,0000,1178    ;1879              ID[PSL]_D                    ; WRITE THE PSL
U 1178, 0818,0038,0580,0800,0000,1179    ;1880              D_K[.1]                      ; SETUP TO CLEAR THE CES REGISTER
U 1179, 0D00,003C,0180,0800,0000,117A    ;1881              D_DAL.SC
U 117A, 0F00,003C,3180,3C00,0000,117B    ;1882              ID[CES]_D,D_0                ; CLEAR THE CES REGISTER
U 117B, 0000,003C,5D80,3C00,0000,1180    ;1883              ID[ACC.CS]_D                 ; SHUT OFF THE FLOATING POINT
U 1180, 0000,003C,3980,3C00,0000,1181    ;1884              ID[SIR]_D                    ; CLEAR THE SIR REGISTER
U 1181, 0000,003C,2980,3C00,0000,1182    ;1885              ID[CLK.CS]_D                 ; STOP INTERVAL TIMER
U 1182, 0000,003C,4980,3C00,0000,1183    ;1886              ID[TBER0]_D                  ; SHUT OFF THE TB
U 1183, 0818,0038,C180,0800,0000,1184    ;1887              D_K[.FFFF]
U 1184, 0000,003C,6580,3C00,0000,1185    ;1888              ID[SBI.ERR]_D
U 1185, 0F00,003C,6D80,3C00,0000,1186    ;1889              ID[FAULT]_D,D_0
U 1186, 0000,003C,6D80,3C00,0000,1187    ;1890              ID[FAULT]_D
U 1187, 0000,003C,6580,3C00,0000,1188    ;1891              ID[SBI.ERR]_D
U 1188, 0003,003C,0180,0AF8,0000,105E    ;1892              R[0F]_0,J/CALLCON            ; CALL THE CONSOLE
U 1189, 0818,0038,0980,0800,0000,105E    ;1893    ERLOOP:   D_K[.2],J/CALLCON            ; ERRLOOP CALL
U 118A, 0810,0038,0180,0978,0000,118B    ;1894    ERROR1:   D_RC[0F]
U 118B, 0819,0034,4D80,0800,0000,104E    ;1895              D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E    ;1896    104E:     D_D.OR.K[.4],J/CALLCON
U 118C, 0810,0038,0180,0978,0000,118D    ;1897    ERROR2:   D_RC[0F]
U 118D, 0819,0034,4D80,0800,0000,105A    ;1898              D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E    ;1899    105A:     D_D.OR.K[.6],J/CALLCON
                                         ;1900    105E:
                                         ;1901    CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E    ;1902              ID[TXDB]_D,J/CALLCON         ; CALL THE CONSOLE
                                         ;1903    ;+
                                         ;1904    ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                         ;1905    ;-
U 13F0, 0000,003C,0180,0800,0000,13F1    ;1906    13F0:     NOP
U 13F1, 0000,003C,0180,0800,0000,13F2    ;1907    13F1:     NOP
U 13F2, 0000,003C,0180,0800,0000,13F3    ;1908    13F2:     NOP
U 13F3, 0000,003C,0180,0800,0000,13F4    ;1909    13F3:     NOP
U 13F4, 0000,003C,0180,0800,0000,13F5    ;1910    13F4:     NOP
U 13F5, 0000,003C,0180,0800,0000,13F6    ;1911    13F5:     NOP
U 13F6, 0000,003C,0180,0800,0000,13F7    ;1912    13F6:     NOP
U 13F7, 0000,003C,0180,0800,0000,13F8    ;1913    13F7:     NOP
U 13F8, 0000,003C,0180,0800,0000,13F9    ;1914    13F8:     NOP
U 13F9, 0000,003C,0180,0800,0000,13FA    ;1915    13F9:     NOP
```

```
U 13FA, 0000,003C,0180,0800,0000,13FB    ;1916   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC    ;1917   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD    ;1918   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE    ;1919   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF    ;1920   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155    ;1921   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA    ;1922   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,118E    ;1923   12AA:   NOP
                                         ;1924   ;+
                                         ;1925   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                         ;1926   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                         ;1927   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                         ;1928   ; TYPING IT.
                                         ;1929   ;-
U 118E, 0810,0038,4D80,0978,0000,118F    ;1930   SUBTST: D_RC[OF],KMX/.FF00
U 118F, 0019,4016,4D80,09F8,0000,0001    ;1931           RC[OF]_D+K[.FF00],WORD,RETURN1
                                         ;1932   ;+
                                         ;1933   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                         ;1934   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                         ;1935   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                         ;1936   ;-
U 1190, 0010,0038,01C0,0978,0000,1191    ;1937   SETRCF: Q_RC[OF]
U 1191, 0019,2034,4DC0,0800,0000,1192    ;1938           Q_Q.AND.K[.FF00]
U 1192, 0019,2032,1D80,09F8,0000,0001    ;1939           RC[OF]_Q.OR.SC,RETURN1
                                         ;1940   ; THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
                                         ;1941   ; AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
                                         ;1942   ; UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
                                         ;1943   ; ARE LOST.
U 1193, 0F18,0038,C1F8,0800,0000,1008    ;1944   CSOFF:  D_0,Q_0,ALU_K[.FFFF]
U 1008, 0500,003D,8780,0800,0084,71D8    ;1945   =0      SC_K[.C],D_D.LEFT,SI/7,CALL,J/DC9
U 1009, 0D00,003C,0180,0800,0000,1194    ;1946           D_DAL.SC
U 1194, 0000,003E,7580,3C00,0000,0001    ;1947           ID[MAINT]_D,RETURN1
                                         ;1948   ; THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
                                         ;1949   ; BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.
U 1195, 0818,0038,0DF8,0800,0000,1196    ;1950   COFF:   D_K[.3],Q_0
U 1196, 0000,003C,6180,0800,0084,7197    ;1951           SC_K[.F]
U 1197, 0D00,003C,0180,0800,0000,1198    ;1952           D_DAL.SC
U 1198, 0000,003E,7580,3C00,0000,0001    ;1953           ID[MAINT]_D,RETURN1
                                         ;1954   ; THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
                                         ;1955   ; APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.
U 1199, 0000,003C,8580,0800,0084,719A    ;1956   SOFF:   SC_K[.C]
U 119A, 0803,001C,0180,0800,0000,119B    ;1957           ALU_NOT.MASK,D_ALU
U 119B, 0000,003E,7580,3C00,0000,0001    ;1958           ID[MAINT]_D,RETURN1
                                         ;1959   ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                         ;1960   ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                         ;1961   ; CERTAIN TRAPS.
                                         ;1962   =0
U 100A, 0000,003D,0180,0800,0000,11DC    ;1963   DC.DE:  CALL,J/DCD
U 100B, 0000,003C,0180,0800,0000,11DD    ;1964           J/DCE
                                         ;1965   ; THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
                                         ;1966   ; IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
                                         ;1967   ; VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
                                         ;1968   ; MME WILL BE SET HERE. UPON RETURN THE CONTENTS
                                         ;1969   ; OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
                                         ;1970   ; D AND Q ARE LOST.
```

```
                                        ;1971   ; THIS ROUTINE WRITES GROUP 1
                                        ;1972   =0
U 100C, 0F00,003D,0180,0800,0000,11D7   ;1973   TBWR1:  D_0,CALL,J/DC8
U 100D, 0100,003C,0180,0800,0000,1010   ;1974   TBWR:   D_D.LEFT2,SI/ZERO
U 1010, 0100,003D,0180,0800,0000,11CF   ;1975   =0      D_D.LEFT2,SI/ZERO,CALL,J/DC0
U 1011, 0100,003C,0180,0800,0000,1012   ;1976           D_D.LEFT2,SI/ZERO
U 1012, 0100,003D,0180,0800,0000,11D0   ;1977   =0      D_D.LEFT2,SI/ZERO,CALL,J/DC1
U 1013, 0800,003C,4980,3E40,0000,119C   ;1978   TBWRA:  ID[TBER0]_D,D_R[8]
U 119C, 0000,003C,4180,3C00,0000,119D   ;1979           ID[TBUF]_D
U 119D, 0000,003E,4DF0,2C00,0000,0001   ;1980           Q_ID[TBER1],RETURN1
                                        ;1981   ; ROUTINE TO WRITE GROUP 0
                                        ;1982   =0
U 1014, 0F00,003D,0180,0800,0000,11D3   ;1983   TBWR0:  D_0,CALL,J/DC4
U 1015, 0000,003C,0180,0800,0000,100D   ;1984           J/TBWR
                                        ;1985   ; ROUTINE TO WRITE BOTH GROUP 0 AND 1
                                        ;1986   =0
U 1018, 0F00,003D,0180,0800,0000,11D7   ;1987   TBWRB:  D_0,CALL,J/DC8
U 1019, 0500,003C,0180,0800,0000,100D   ;1988           D_D.LEFT,SI/ZERO,J/TBWR
                                        ;1989   ; THIS ROUTINE WRITES THE TB RANDOMLY.
U 119E, 0818,0038,0580,0800,0000,1013   ;1990   TBWRAN: D_K[.1],J/TBWRA
                                        ;1991   ; THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
                                        ;1992   ; THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
                                        ;1993   ; R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
                                        ;1994   ; TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
                                        ;1995   ; R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
                                        ;1996   =0
U 101A, 0800,003D,0180,0A30,0000,11CF   ;1997   RELSUB: D_R[6],CALL,J/DC0
U 101B, 0500,003C,D980,0A28,0084,701C   ;1998           D_D.LEFT,SI/ZERO,SC_K[.9],LAB_R[5]
U 101C, 0003,0011,01C0,0800,0000,11CF   ;1999   =0      ALU_MASK+1,Q_ALU,CALL,J/DC0
U 101D, 001C,0024,01C0,0800,0000,119F   ;2000           ALU_LA[ANDNOT]Q,Q_ALU
U 119F, 081D,0030,0180,0800,0000,11A0   ;2001           ALU_D[OR]Q,D_ALU
U 11A0, 0200,003C,0180,0800,0000,11A1   ;2002           D_D.RIGHT2,SI/ZERO
U 11A1, 0001,003E,0180,0AB8,0000,0001   ;2003           R[7]_D,RETURN1
                                        ;2004   ; THIS SUBROUTINE IS CALLED TO RELOCATE THE VA, GET THE
                                        ;2005   ; TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
                                        ;2006   ; RETURN3 IF THEY ARE EQUAL; RETURN 2 IF THEY ARE NOT EQUAL;
                                        ;2007   ; AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
                                        ;2008   ; INDICATED IN R[E].
U 11A2, 0000,003C,0180,0A70,0000,11A3   ;2009   RELCHK: LAB_R[0E]
U 11A3, 0000,003C,0180,52F8,0000,11A4   ;2010           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERNCE
U 11A4, 0800,003C,69F0,2E78,0000,11A5   ;2011           Q_ID[TIME.ADDR],D_R[0F]
U 11A5, 0018,0038,1980,0AF8,0000,11A6   ;2012           ALU_0(K),R[0F]_ALU
U 11A6, 0000,003C,0180,0A70,0000,11A7   ;2013           LAB_R[0E]
U 11A7, 001C,2000,0180,0800,0010,11A8   ;2014           ALU_LA[A-B]D,CLK.UBCC           ; SEE IF A TRAP OCCURRED.
U 11A8, 0000,013C,0180,0800,0000,1020   ;2015           Z?
U 1020, 0001,003C,0180,09C8,0000,11B1   ;2016   =0      RC[9]_D,J/TBTRUE        ; TRAPPED SO RETURN1.
U 1021, 0000,003C,0180,0800,0000,1022   ;2017           NOP
U 1022, 0F00,003D,0180,0800,0000,11DD   ;2018   =0      D_0,CALL,J/DCE                  ; MASK OFF THE UPPER 4 BITS
U 1023, 0500,003C,0180,0800,0000,11A9   ;2019           D_D.LEFT,SI/ZERO
U 11A9, 0001,003C,0180,0800,0082,11AA   ;2020           SC_D
U 11AA, 0803,0010,0180,0800,0000,11AB   ;2021           ALU_MASK+1,D_ALU
U 11AB, 001D,2024,01C0,0800,0000,11AC   ;2022           ALU_Q[ANDNOT]D,Q_ALU
U 11AC, 0800,003C,0180,0A38,0000,11AD   ;2023           D_R[7]                          ; SEE IF ADDRESS RELOCATED
U 11AD, 0001,003C,0180,09E0,0000,11AE   ;2024           RC[0C]_D
U 11AE, 0001,203C,0180,09D8,0000,11AF   ;2025           RC[0B]_Q
```

```
U 11AF, 001D,2000,0180,0800,0010,11B0   ;2026           ALU_Q-D,CLK.UBCC                ; PROPERLY.
U 11B0, 0000,013C,0180,0800,0000,1024   ;2027           Z?
U 1024, 0000,003E,0180,0800,0000,0002   ;2028   =0      RETURN2                         ; INCORRECT.
U 1025, 0000,003E,0180,0800,0000,0003   ;2029           RETURN3                         ; OK
U 11B1, 0000,003C,4DF0,2C00,0000,11B2   ;2030   TBTRUE: Q_ID[TBER1]
U 11B2, 0001,203E,0180,09F0,0000,0001   ;2031           RC[OE]_Q,RETURN1
                                        ;2032   ; THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
                                        ;2033   ; IF NO TRAP OCCURS WHEN THE REFERNCE IS MADE EXECUTE A RETURN1.
                                        ;2034   ; IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
                                        ;2035   ; A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
U 11B3, 0000,003C,0180,0A70,0000,11B4   ;2036   MISS:   LAB_R[OE]
U 11B4, 0000,003C,0180,52F8,0000,11B5   ;2037           R[OF]_LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
U 11B5, 0800,003C,0180,0A78,0000,11B6   ;2038           D_R[OF]
U 11B6, 0018,0038,1980,0AF8,0000,11B7   ;2039           ALU_0(K),R[OF]_ALU
U 11B7, 0000,003C,0180,0A70,0000,11B8   ;2040           LAB_R[OE]
U 11B8, 0001,003C,0180,09C8,0000,11B9   ;2041           RC[9]_D
U 11B9, 001C,2000,0180,0800,0010,11BA   ;2042           ALU_LA[A-B]D,CLK.UBCC           ; SEE IF A TRAP OCCRRED.
U 11BA, 0000,013C,0180,0800,0000,1028   ;2043           Z?
U 1028, 0000,003C,D580,0800,0084,71BB   ;2044   =0      SC_K[.6],J/MISSA
U 1029, 0000,003E,0180,0800,0000,0001   ;2045           RETURN1                         ; NO TRAP SO RETURN1.
                                        ;2046                                           ; IF A TRAP OCCURRED SEE
U 11BB, 0001,0024,0180,0800,0010,11BC   ;2047   MISSA:  ALU_D.ANDNOT.MASK,CLK.UBCC      ; IF IT WAS A TB MISS TRAP.
U 11BC, 0000,013C,4DF0,2C00,0000,102A   ;2048           Z?,Q_ID[TBER1]
U 1024, 0001,203E,0180,09F0,0000,0002   ;2049   =0      RETURN2,RC[OE]_Q                ; NOT TB MISS.
U 102B, 0000,003E,0180,0800,0000,0003   ;2050           RETURN3                         ; TB MISS.
                                        ;2051   ; THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
                                        ;2052   ; RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
                                        ;2053   ; TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
                                        ;2054   ; HIT/MISS BIT IN TBER0 IS INCORRECT.
                                        ;2055   ; RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
                                        ;2056   ; CHECK HIT IN GROUP 0.
U 11BD, 0000,003C,D580,0A70,0084,71BE   ;2057   HIT0:   LAB_R[OE],SC_K[.6]
U 11BE, 0000,003C,0180,52F8,0000,11BF   ;2058   HIT:    R[OF]_LA,FS/MCT,MCT/READ.V.WCHK         ; NO TRAP IF HIT
U 11BF, 0800,003C,49F0,2E78,0000,11C0   ;2059           Q_ID[TBER0],D_R[OF]
U 11C0, 0018,0038,1980,0AF8,0000,11C1   ;2060           ALU_0(K),R[OF]_ALU
U 11C1, 0001,203C,0180,09E8,0000,11C2   ;2061           RC[0D]_Q
U 11C2, 0003,001C,0180,09F0,0000,11C3   ;2062           RC[OE]_ALU,ALU_NOT.MASK
U 11C3, 0000,003C,0180,0A70,0000,11C4   ;2063           LAB_R[OE]
U 11C4, 001C,2000,0180,0800,0010,11C5   ;2064           ALU_LA[A-B]D,CLK.UBCC                   ; SEE IF TRAP OCCURRED.
U 11C5, 0001,013C,0180,09C8,0000,102C   ;2065           Z?,RC[9]_D
U 102C, 0000,003C,0180,0800,0000,11C7   ;2066   =0      J/HITA                          ; TRAP OCCURRED.
U 102D, 0001,2024,0180,0800,0010,11C6   ;2067           ALU_Q.ANDNOT.MASK,CLK.UBCC      ; NO TRAP BUT IS HIT/MISS BIT SET?
U 11C6, 0000,013C,0180,0800,0000,1030   ;2068           Z?
U 1030, 0000,003E,0180,0800,0000,0004   ;2069   =0      RETURN4                         ; SET SO IT WAS A HIT.
U 1031, 0000,003E,0180,0800,0000,0003   ;2070           RETURN3                         ; CLEAR SO REFERENCE WAS A MISS.
U 11C7, 0000,003C,D580,0800,0084,71C8   ;2071   HITA:   SC_K[.6]                        ; TRAPPED, SO SEE IF TB MISS TRAP.
U 11C8, 0001,0024,0180,0800,0010,11C9   ;2072           ALU_D.ANDNOT.MASK,CLK.UBCC
U 11C9, 0000,013C,0180,0800,0000,1032   ;2073           Z?
U 1032, 0000,003C,0180,0800,0000,11B1   ;2074   =0      J/TBTRUE                        ; NOT TB MISS TRAP.
U 1033, 0000,003E,0180,0800,0000,0002   ;2075           RETURN2                         ; TB MISS TRAP OCCURRED.
                                        ;2076   ; CHECK HIT IN GROUP 1.
U 11CA, 0000,003C,5D80,0A70,0084,71BE   ;2077   HIT1:   LAB_R[OE],SC_K[.7],J/HIT
                                        ;2078   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 11CB, 0118,0038,1B80,0800,0000,11DF   ;2079   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 11CC, 0118,0038,0B80,0800,0000,11DF   ;2080   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
```

```
U 11CD, 0118,0038,0780,0800,0000,11DF   ;2081   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 11CE, 0118,0038,C380,0800,0000,11DF   ;2082   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 11CF, 0018,0038,1980,0800,0000,11CB   ;2083   DC0:    ALU_0(K),J/S00
U 11D0, 0018,0038,1980,0800,0000,11CC   ;2084   DC1:    ALU_0(K),J/S01
U 11D1, 0018,0038,1980,0800,0000,11CD   ;2085   DC2:    ALU_0(K),J/S10
U 11D2, 0018,0038,1980,0800,0000,11CE   ;2086   DC3:    ALU_0(K),J/S11
U 11D3, 0018,0038,0980,0800,0000,11CB   ;2087   DC4:    ALU_K[.2],J/S00
U 11D4, 0018,0038,0980,0800,0000,11CC   ;2088   DC5:    ALU_K[.2],J/S01
U 11D5, 0018,0038,0980,0800,0000,11CD   ;2089   DC6:    ALU_K[.2],J/S10
U 11D6, 0018,0038,0980,0800,0000,11CE   ;2090   DC7:    ALU_K[.2],J/S11
U 11D7, 0018,0038,0580,0800,0000,11CB   ;2091   DC8:    ALU_K[.1],J/S00
U 11D8, 0018,0038,0580,0800,0000,11CC   ;2092   DC9:    ALU_K[.1],J/S01
U 11D9, 0018,0038,0580,0800,0000,11CD   ;2093   DCA:    ALU_K[.1],J/S10
U 11DA, 0018,0038,0580,0800,0000,11CE   ;2094   DCB:    ALU_K[.1],J/S11
U 11DB, 0018,0038,C180,0800,0000,11CB   ;2095   DCC:    ALU_K[.FFFF],J/S00
U 11DC, 0018,0038,C180,0800,0000,11CC   ;2096   DCD:    ALU_K[.FFFF],J/S01
U 11DD, 0018,0038,C180,0800,0000,11CD   ;2097   DCE:    ALU_K[.FFFF],J/S10
U 11DE, 0018,0038,C180,0800,0000,11CE   ;2098   DCF:    ALU_K[.FFFF],J/S11
U 11DF, 0100,003E,0380,0800,0000,0001   ;2099   SX:     D_D.LEFT2,SI/7,RETURN1
U 11E0, 0018,0038,01C0,0800,0000,1034   ;2100   DC.5:   Q_K[.8]
                                        ;2101   =0
U 1034, 0000,003D,0180,0800,0000,11D4   ;2102   DC.5A:  CALL,J/DC5
U 1035, 0019,2000,05C0,0800,0010,11E1   ;2103           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 11E1, 0000,013C,0180,0800,0000,1038   ;2104           Z?
U 1038, 0000,003C,0180,0800,0000,1034   ;2105   =0      J/DC.5A
U 1039, 0000,003E,0180,0800,0000,0001   ;2106           RETURN1
                                        ;2107   =0
U 103A, 0000,003D,0180,0800,0000,11E0   ;2108   DC.A:   CALL,J/DC.5
U 103B, 0500,003E,0180,0800,0000,0001   ;2109           D_D.LEFT,SI/ZERO,RETURN1
U 11E2, 0018,0038,01C0,0800,0000,103C   ;2110   DC.9:   Q_K[.8]
                                        ;2111   =0
U 103C, 0000,003D,0180,0800,0000,11D8   ;2112   DC.9A:  CALL,J/DC9
U 103D, 0019,2000,05C0,0800,0010,11E3   ;2113           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 11E3, 0000,013C,0180,0800,0000,1048   ;2114           Z?
U 1048, 0000,003C,0180,0800,0000,103C   ;2115   =0      J/DC.9A
U 1049, 0000,003E,0180,0800,0000,0001   ;2116           RETURN1
                                        ;2117   =0
U 104A, 0000,003D,0180,0800,0000,11E2   ;2118   DC.C:   CALL,J/DC.9
U 104B, 0018,0038,C180,0800,0000,11E4   ;2119           ALU_K[.FFFF]
U 11E4, 0600,003E,0380,0800,0000,0001   ;2120           D_D.RIGHT,SI/7,RETURN1
                                        ;2121   =0
U 104C, 0000,003D,0180,0800,0000,11E2   ;2122   DC.6:   CALL,J/DC.9
U 104D, 0018,0038,0580,0800,0000,11E5   ;2123           ALU_K[.1]
U 11E5, 0100,003E,0380,0800,0000,0001   ;2124           D_D.LEFT2,SI/7,RETURN1
                                        ;2125   =0
U 1058, 0000,003D,0180,0800,0000,11E2   ;2126   DC.3:   CALL,J/DC.9
U 1059, 0018,0038,C180,0800,0000,11E6   ;2127           ALU_K[.FFFF]
U 11E6, 0500,003E,0380,0800,0000,0001   ;2128           D_D.LEFT,SI/7,RETURN1
                                        ;2129   ; THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
                                        ;2130   ; A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
                                        ;2131   ; SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
                                        ;2132   ; FOLLOWING DATA PATTERNS:
                                        ;2133   ;
                                        ;2134   ;       R[0B]           7FFFC000
                                        ;2135   ;       R[0C]           A4000000
```

```
                                          ;2136   :         R[OD]           001FFFFF
                                          ;2137   :
                                          ;2138   :         RC[0]           A4155555
                                          ;2139   :         RC[1]           4CCCC000
                                          ;2140   :         RC[2]           0AAAAA80
                                          ;2141   :
                                          ;2142   :         RC[3]           A4199999
                                          ;2143   :         RC[4]           55554000
                                          ;2144   :         RC[5]           0CCCCC80
                                          ;2145   :
                                          ;2146   :         RC[6]           A40AAAAA
                                          ;2147   :         RC[7]           33330000
                                          ;2148   :         RC[8]           05555500
                                          ;2149   :
                                          ;2150   :         R[0]            A4066666
                                          ;2151   :         R[1]            2AAA8000
                                          ;2152   :         R[2]            03333300
                                          ;2153   :
U 11E7, 0F18,0038,0580,0800,0000,11E8     ;2154   TBWPTP:   D_0,ALU_K[.1]
U 11E8, 0218,0038,0B80,0800,0000,11E9     ;2155             D_D.RIGHT2,SI/7,ALU_K[.2]
U 11E9, 0218,0038,0B80,0800,0000,11EA     ;2156             D_D.RIGHT2,SI/7,ALU_K[.2]
U 11EA, 0200,003C,0380,0800,0000,11EB     ;2157             D_D.RIGHT2,SI/7
U 11EB, 0001,003C,6180,0AE0,0084,71EC     ;2158             R[OC]_D,SC_K[.F]
U 11EC, 0043,0010,0180,0AD8,0000,11ED     ;2159             ALU_MASK+1_R[OB]_ALU.RIGHT,SI/ZERO
U 11ED, 081B,0000,0580,0800,0000,11EE     ;2160             D_0-K[.1]
U 11EE, 0018,0038,21C0,0800,0000,11EF     ;2161             Q_K[.14]
U 11EF, 0019,2014,0580,0800,0082,11F0     ;2162             A[U_Q+K[.1],SC_ALU
U 11F0, 0003,001C,01C0,0800,0000,105C     ;2163             ALU_NOT.MASK,Q_ALU
U 105C, 001D,2015,0180,0AE8,0000,11E0     ;2164   =0        ALU_Q[A+B]D,R[OD]_ALU,CALL,J/DC.5
U 105D, 081C,2034,0180,0A68,0000,11F1     ;2165             LAB_R[OD],ALU_LA[AND]D,D_ALU
U 11F1, 081C,2030,0180,0A60,0000,11F2     ;2166             LAB_R[OC],ALU_LA[OR]D,D_ALU
U 11F2, 0001,003C,0180,0980,0000,1078     ;2167             RC[0]_D
U 1078, 0001,003D,0180,0AB0,0000,104A     ;2168   =0        R[6]_D,CALL,J/DC.C
U 1079, 0000,003C,0180,0A58,0000,11F3     ;2169             LAB_R[OB]
U 11F3, 081C,2034,0180,0988,0000,107A     ;2170             ALU_LA[AND]D,D_ALU,RC[1]_ALU
U 107A, 0001,003D,0180,0AA8,0000,101A     ;2171   =0        R[5]_D,CALL,J/RELSUB
U 107B, 0000,003C,0180,0800,0000,107C     ;2172             NOP
U 107C, 0001,003D,0180,0990,0000,11E2     ;2173   =0        RC[2]_D,CALL,J/DC.9
U 107D, 081C,2034,0180,0A68,0000,11F4     ;2174             LAP_R[OD],ALU_LA[AND]D,D_ALU
U 1 F4, 081C,2030,0180,0A60,0000,11F5     ;2175             LAB_R[OC],ALU_LA[OR]D,D_ALU
U 11F5, 0001,003C,0180,0998,0000,107E     ;2176             RC[3]_D
U 107E, 0001,003D,0180,0AB0,0000,11E0     ;2177   =0        R[6]_D,CALL,J/DC.5
U 107F, 0000,003C,0180,0A58,0000,11F6     ;2178             LAB_R[OB]
U 11F6, 081C,2034,0180,09A0,0000,1080     ;2179             ALU_LA[AND]D,D_ALU,RC[4]_ALU
U 1080, 0001,C03D,0180,0AA8,0000,101A     ;2180   =0        R[5]_D,CALL,J/RELSUB
U 1081, 0000,003C,0180,0800,0000,1082     ;2181             NOP
U 1082, 0001,003D,0180,09A8,0000,103A     ;2182   =0        RC[5]_D,CALL,J/DC.A
U 1083, 081C,2034,0180,0A68,0000,11F7     ;2183             LAB_R[OD],ALU_LA[AND]D,D_ALU
U 11F7, 081C,2030,0180,0A60,0000,11F8     ;2184             LAB_R[OC],ALU_LA[OR]D,D_ALU
U 11F8, 0001,003C,0180,09B0,0000,1084     ;2185             RC[6]_D
U 1084, 0001,003D,0180,0AB0,0000,1058     ;2186   =0        R[6]_D,CALL,J/DC.3
U 1085, 0000,003C,0180,0A58,0000,11F9     ;2187             LAB_R[OB]
U 11F9, 081C,2034,0180,09B8,0000,1086     ;2188             ALU_LA[AND]D,D_ALU,RC[7]_ALU
U 1086, 0001,003D,0180,0AA8,0000,101A     ;2189   =0        R[5]_D,CALL,J/RELSUB
U 1087, 0000,003C,0180,0800,0000,1088     ;2190             NOP
```

```
U 1088, 0001,003D,0180,09C0,0000,104C   ;2191   =0      RC[8]_D,CALL,J/DC.6
U 1089, 081C,2034,0180,0A68,0000,11FA   ;2192           LAB_R[0D],ALU_LA[AND]D,D_ALU
U 11FA, 081C,2030,0180,0A60,0000,11FB   ;2193           LAB_R[0C],ALU_LA[OR]D,D_ALU
U 11FB, 0001,003C,0180,0A80,0000,108A   ;2194           R[0]_D
U 108A, 0001,003D,0180,0AB0,0000,103A   ;2195   =0      R[6]_D,CALL,J/DC.A
U 108B, 0000,003C,0180,0A58,0000,1200   ;2196           LAB_R[0B]
U 1200, 081C,2034,0180,0A88,0000,108C   ;2197           ALU_LA[AND]D,D_ALU,R[1]_ALU
U 108C, 0001,003D,0180,0AA8,0000,101A   ;2198   =0      R[5]_D,CALL,J/RELSUB
U 108D, 0001,003E,0180,0A90,0000,0001   ;2199           R[2]_D,RETURN1
                                        ;2200   ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
                                        ;2201   ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
                                        ;2202   ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 1201, 0000,003F,0180,0800,0000,117C   ;2203   TARGC3: SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001   ;2204   117C:   RETURN1
U 117D, 0000,003E,0180,0800,0000,0002   ;2205   117D:   RETURN2
U 117E, 0000,003E,0180,0800,0000,0003   ;2206   117E:   RETURN3
U 117F, 0000,003E,0180,0800,0000,0004   ;2207   117F:   RETURN4
U 11FC, 0000,003D,0180,0800,0000,118A   ;2208   11FC:   ERROR1
U 11FD, 0000,003D,0180,0800,0000,118A   ;2209   11FD:   ERROR1
U 11FE, 0000,003D,0180,0800,0000,118A   ;2210   11FE:   ERROR1
U 11FF, 0000,003D,0180,0800,0000,118A   ;2211   11FF:   ERROR1
                                        ;2212   ;+
                                        ;2213   ; THE FOLLOWING SUBROUTINES ARE USED IN THE MOVING INVERSIONS TEST
                                        ;2214   ; OF THE TRANSLATION BUFFER
                                        ;2215   ;-
                                        ;2216   ;+
                                        ;2217   ; FILL THE TB ADDRESS AND DATA MATRIX WITH ZERO'S. ASSUMES THAT THE
                                        ;2218   ; WRITE BOTH BIT IS SET IN TBER0.
                                        ;2219   ;-
                                        ;2220   FILLZERO:
U 1202, 0018,0038,3180,0A80,0000,1203   ;2221           R[0]_K[.40]                     ; SET THE LOOP COUNT
U 1203, 0000,003C,D980,0800,0084,7204   ;2222           SC_K[.9]                        ; GENERATE THE ADDRESS INCREMENT
U 1204, 0003,001C,0180,0988,0000,1205   ;2223           RC[1]_NOT.MASK
U 1205, 0003,003C,8D80,0A88,0084,7206   ;2224           R[1]_0,SC_K[.1F]                ; INIT THE ADDRESS
U 1206, 0000,003C,0180,0A08,0200,1207   ;2225   FILLOP: VA_A[U,ALU_R[1]                 ; LOAD THE ADDRESS
U 1207, 0803,001C,0180,0800,0000,1208   ;2226           D_NOT.MASK                      ; GET VALID PTE
U 1208, 0000,003C,4180,3C00,0000,1209   ;2227           ID[TBUF]_D                      ; LOAD THE TB
U 1209, 0800,003C,0180,0A00,0000,120A   ;2228           D_R[0]                          ; LOOP DONE?
U 120A, 0019,0000,0580,0A80,0010,120B   ;2229           R[0]_D-K[.1],CLK.UBCC
U 120B, 0000,013C,0180,0800,0000,108E   ;2230           Z?
U 108E, 0000,003C,7580,0800,0000,120C   ;2231   =0      J/FILLINC,K[.20]
U 108F, 0000,003E,0180,0800,0000,0001   ;2232           RETURN1
U 120C, 0019,0000,7580,0800,0010,120D   ;2233   FILLINC:ALU_D-K[.20],CLK.UBCC           ; TIME FOR BIT 31?
U 120D, 0000,013C,0180,0908,0000,1090   ;2234           Z?,LC_RC[1]
U 1090, 0FC0,003C,0180,0800,0000,120E   ;2235   =0      D_0,J/NOBIT31FILL
U 1091, 0803,001C,0180,0908,0000,120E   ;2236           D_NOT.MASK,LC_RC[1]
                                        ;2237   NOBIT31FILL:
U 120E, 081C,2030,0180,0A08,0000,120F   ;2238           D_D.OR.R[1]
U 120F, 0811,0014,0180,0800,0000,1210   ;2239           D_D+LC
U 1210, 0811,0034,0180,0900,0000,1211   ;2240           D_D.AND.RC[0]
U 1211, 0001,003C,0180,0A88,0000,1206   ;2241           R[1]_D,J/FILLOP
                                        ;2242   ;+
                                        ;2243   ; THIS ROUTINE INCREMENTS (OR DECREMENTS) THE ADDRESS IN R[3] BY THE
                                        ;2244   ; VALUE IN RC[0C]. R[4] MUST CONTAIN THE CONCATINATED ADDRESS
                                        ;2245   ; BITS (<31,13:9>) IN BIT POSITIONS <5:0>.
```

```
                                              ;2246     ;-
                                              ;2247     INCDECADDRESS:
U 1212, 0800,003C,0180,0A20,0000,1213         ;2248             D_R[4]                          ; GET CONCATENATED ADDRESS
U 1213, 0010,0038,01C0,0960,0000,1214         ;2249             Q_RC[0C]                        ; GET INCREMENT VALUE
U 1214, 0010,0038,0180,0968,0010,1215         ;2250             A[U_RC[0D],CLK.UBCC             ; FOREWARD SEQ?
U 1215, 0000,013C,0180,0800,0000,1092         ;2251             Z?
U 1092, 0000,003C,0180,0800,0000,121A         ;2252     =0      J/DECADDRESS                    ; NO
U 1093, 081D,0014,D580,0800,0084,7216         ;2253             D_D+Q,SC_K[.6]                  ; INCREMENT THE ADDRESS
U 1216, 0001,0024,0180,0800,0010,1217         ;2254             A[U_D.ANDNOT.MASK,CLK.UBCC      ; MASK
U 1217, 0003,0110,01C0,0800,0000,1094         ;2255             Z?,Q_MASK+1                     ; OVERFLOW?
U 1094, 0000,003C,0180,0800,0000,1218         ;2256     =0      J/INCOVERFLOW                   ; YES
U 1095, 0001,003C,0180,0AA0,0000,121C         ;2257             R[4]_D,J/SETDATA
                                              ;2258     INCOVERFLOW:
U 1218, 0819,0014,0580,0800,0000,1219         ;2259             D_D+K[.1]                       ; ADD THE CARRY
U 1219, 001D,0024,0180,0AA0,0000,121C         ;2260             R[4]_D.ANDNOT.Q,J/SETDATA       ; THROWAWAY BIT 6
                                              ;2261     DECADDRESS:
U 121A, 081D,0000,0180,0800,0010,121B         ;2262             D_D-Q,CLK.UBCC                  ; DECREMENT THE ADDRESS
U 121B, 0018,1B38,55C0,0800,0000,1007         ;2263             A[U.N?,Q_K[.3F]                 ; UNDERFLOW?
U 1007, 0001,003C,0180,0AA0,0000,121C         ;2264     =0111   R[4]_D,J/SETDATA                ; NO
U 100F, 001D,0014,0180,0AA0,0000,121C         ;2265             R[4]_D+Q,J/SETDATA              ; FIXUP THE UNDERFLOW
                                              ;2266     SETDATA:
U 121C, 0800,003C,E5F8,0A20,0084,721D         ;2267             SC_K[.1A],D_R[4],Q_0            ; PUT ADDRESS BACK INTO BITS 31
U 121D, 0D00,003C,8D80,0800,0084,721E         ;2268             D_DAL.SC,SC_K[.1F]              ; AND 13:9
U 121E, 0001,0024,D980,0A88,0084,721F         ;2269             R[1]_D.ANDNOT.MASK,SC_K[.9]
U 121F, 0818,0034,8DF8,0A20,0000,1220         ;2270             D_R[4].AND.K[.1F],Q_0
U 1220, 0D00,003C,0180,0800,0000,1221         ;2271             D_DAL.SC
U 1221, 081C,2030,0180,0A08,0000,1222         ;2272             D_D.OR.R[1]
U 1222, 0000,003C,01C0,0A18,0000,1223         ;2273             Q_R[3]
U 1223, 0011,2024,01C0,0900,0000,1224         ;2274             Q_Q.ANDNOT.RC[0]
U 1224, 001D,0032,0180,0A98,0000,0001         ;2275             R[3]_D.OR.Q,RETURN1
                                              ;2276     ;+
                                              ;2277     ; THIS ROUTINE LEFT SHIFTS BITS <30:24> AND <23:15> OF R[3]. IF THE
                                              ;2278     ; CONTENTS OF RC[0D] IS ZERO, ONE'S ARE INSERTED OTHERWISE, THE FIELD IS
                                              ;2279     ; ASSUMED TO BE ALL ONE'S AND ZERO'S ARE INSERTED.
                                              ;2280     ;-
                                              ;2281     SETNEWDATABIT:
U 1225, 0800,003C,B580,0A18,0084,7226         ;2282             D_R[3],SC_K[.FFF1]              ; GET THE DATA TO SHIFT
U 1226, 0000,003C,0DF8,0800,0084,9227         ;2283             SC_SC+K[.3],Q_0                 ; SETUP TO SHIFT BITS <30:15>
U 1227, 0D00,003C,0180,0800,0000,1228         ;2284             D_DAL.SC                        ; INTO BITS <16:1>
U 1228, 0819,0034,C180,0800,0000,1229         ;2285             D_D.AND.K[.FFFF]                ; MASK
U 1229, 0819,0024,0580,0800,0000,122A         ;2286             D_D.ANDNOT.K[.1]                ; CLEAR BIT 0
U 122A, 0000,003C,0180,0A10,0010,122B         ;2287             A[U_R[2],CLK.UBCC               ; DATA = 0?
U 122B, 0000,013C,0180,0800,0000,1096         ;2288             Z?
U 1096, 0000,003C,0180,0800,0000,122D         ;2289     =0      J/SHIFTINZERO                   ; NO
U 1097, 0819,0030,6580,0800,0000,122C         ;2290             D_D.OR.K[.10]                   ; INSERT BIT 8
U 122C, 0819,0030,0580,0800,0000,121C         ;2291             D_D.OR.K[.1],J/SETDATA          ; AND BIT 0
                                              ;2292     SHIFTINZERO:
U 122D, 0819,0024,6580,0800,0000,122E         ;2293             D_D.ANDNOT.K[.10]               ; CLEAR BIT 8
U 122E, 0000,003C,61F8,0800,0084,722F         ;2294     SETADR: SC_K[.F],Q_0                    ; SHIFT BACK TO BITS <30:15>
U 122F, 0D00,003C,01C0,0A18,0000,1230         ;2295             D_DAL.SC,Q_R[3]                 ; GET ADDRESS
U 1230, 0011,2034,01C0,0900,0000,1231         ;2296             Q_Q.AND.RC[0]                   ; THROW AWAY OLD DATA BITS
U 1231, 001D,0032,0180,0A98,0000,0001         ;2297             R[3]_D.OR.Q,RETURN1             ; INSERT NEW DATA BITS
                                              ;2298     PTESETNEWDATABIT:
U 1232, 0800,003C,0180,0A30,0000,1233         ;2299             D_R[6]                          ; GET THE CURRENT DATA
U 1233, 0500,003C,0180,0800,0000,1234         ;2300             D_D.LEFT                        ; SHIFT THE DATA
```

```
U 1234, 0000,003C,0180,0A10,0010,1235   ;2301           ALU_R[2],CLK.UBCC                ; DATA = 0?
U 1235, 0000,013C,0180,0800,0000,1098   ;2302           Z?
U 1098, 0000,003C,0180,0800,0000,1236   ;2303   =0      J/PTESHIFTINZERO                 ; NO
U 1099, 081C,2030,0180,0A40,0000,1238   ;2304           D_D.OR.R[8],J/PTESETDATA         ; INSERT THE ONE'S
                                        ;2305   PTESHIFTINZERO:
U 1236, 0000,003C,01C0,0A40,0000,1237   ;2306           Q_R[8]
U 1237, 081D,0024,0180,0800,0000,1238   ;2307           D_D.ANDNOT.Q                     ; CLEAR BIT 0 OF EACH CHIP PATTERN
                                        ;2308   PTESETDATA:
U 1238, 0001,003C,0180,0AB0,0000,1239   ;2309           R[6]_D
U 1239, 0000,003C,01C0,0A28,0000,123A   ;2310           Q_R[5]                           ; GET THE MBZ MASK
U 123A, 001D,0026,0180,0AB8,0000,0001   ;2311           R[7]_D.ANDNOT.Q,RETURN1          ; SET THE REAL PTE
```

```
                                                 .PAGE   "TEST B3        READ.V.NEWPC, HIT IN GROUP 1, TEST"
                                        ;*****************************************************************
                                        ;++
                                        ; TEST  B3      READ.V.NEWPC, HIT IN GROUP 1, TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;        THIS IS A TEST OF A READ.V.NEWPC WITH THE VA
                                        ;        BEING A HIT IN GROUP 1.
                                        ;        THIS TESTS THE GROUP 1 INPUTS TO THE IPA MUX.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;        EXPECTED IPA (AS IT APPEARS IN THE TIME OUT ADDRESS REGISTER)
                                        ;        ACTUAL IPA (FROM TIME OUT ADDRESS REGISTER)
                                        ;        VA
                                        ;        PTE WRITTEN INTO GROUP 1
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;
                                        ;--
                                        ;*****************************************************************
                                        =0
U 109A, 0018,0039,1180,09F8,0000,105B   H1PIBA: NEWTST[.4]
U 109B, 0003,003C,0180,0AF0,0000,109C           R[0E]_0
U 109C, 0000,003D,0180,0800,0000,1193   =0      CALL,J/CSOFF            ; TURN OFF CACHE,SBI
U 109D, 0003,003C,0180,0AF8,0000,109E           R[0F]_0
U 109E, 0000,003D,0180,0800,0000,11E7   =0      CALL,J/TBWPTP           ; GENERATE TEST PATTERNS
U 109F, 0018,0038,2180,0AA0,0000,10A0           R[4]_K[.14]
U 10A0, 0000,003D,0180,0800,0000,1189   =0      ERLOOP
U 10A1, 0010,0038,0180,0920,0200,123B   H1PIBB: VA_RC[4]
U 123B, 0000,003C,0180,0918,0000,10A2           LC_RC[3]
U 10A2, 0010,0039,0180,0AC0,0000,1018   =0      R[8]_LC,CALL,J/TBWRB    ; WRITE BOTH GROUPS
U 10A3, 0000,003C,0180,0A20,0082,123C           SC_R[4]
U 123C, 0000,003C,01C0,0A60,0000,123D           Q_R[0C]
U 123D, 0001,201C,01C0,0800,0000,123E           ALU_Q.ORNOT.MASK,Q_ALU
U 123E, 0000,003C,0180,0A08,0200,123F           VA_R[1]
U 123F, 0000,003C,0180,09E0,0000,1240           RC[0C]_LA
U 1240, 0000,003C,0180,0AA8,0000,10A4           R[5]_LA
U 10A4, 0001,203D,0180,0AB0,0000,101A   =0      R[6]_Q,CALL,J/RELSUB    ; SIMULATE TRANSLATION
U 10A5, 0000,003C,01C0,0A30,0000,1241           Q_R[6]
U 1241, 0001,203C,0180,09D8,0000,10A6           RC[0B]_Q
U 10A6, 0001,203D,0180,0AC0,0000,100C   =0      R[8]_Q,CALL,J/TBWR1     ; WRITE GROUP 1
U 10A7, 0000,003C,0180,6000,0000,1242           FS/MCT,MCT/READ.V.NEWPC : LOAD IPA
U 1242, 0010,0038,0180,0920,0200,1243           VA_RC[4]
U 1243, 0000,003C,0180,F800,0000,1244           FS/MCT,MCT/ALLOW.IB.READ        ; LOAD TOAR
U 1244, 0000,003C,69F0,2C00,0000,1245           Q_ID[TIME.ADDR]
U 1245, 0000,003C,ED80,0800,0084,7246           SC_K[.1B]
U 1246, 0000,003C,0580,0800,0084,9247           SC_SC+K[.1]
U 1247, 0803,0010,0180,0800,0000,1248           ALU_MASK+1,D_ALU
U 1248, 001D,2024,01C0,09E8,0000,1249           ALU_Q[ANDNOT]D,Q_ALU,RC[0D]_ALU
U 1249, 0800,003C,0180,0A38,0000,124A           D_R[7]
U 124A, 001D,2000,0180,0800,0010,124B           ALU_Q-D,CLK.UBCC
U 124B, 0001,013C,0180,09F0,0000,10A8           Z?,RC[0E]_D
U 10A8, 0000,003D,0180,0800,0000,118A   =0      ERROR1                  ; MUX SELECTS FAILED,WRONG GROUP
```

```
U 10A9, 0000,003C,0180,0A08,0200,124C    ;2367            VA_R[1]
U 124C, 0000,003C,0180,09E0,0000,124D    ;2368            RC[0C]_LA
U 124D, 0000,003C,0180,0A20,0082,124E    ;2369            SC_R[4]
U 124E, 0000,003C,01C0,0A68,0000,124F    ;2370            Q_R[0D]
U 124F, 0001,2034,01C0,0A60,0000,10AA    ;2371            ALU_Q.AND.MASK,Q_ALU,LAB_R[0C]
U 10AA, 001C,0031,01C0,0AB0,0000,101A    ;2372    =0      ALU_LA[OR]Q,Q_ALU,R[6]_ALU,CALL,J/RELSUB ; SIMULATE TRANSLATION
U 10AB, 0000,003C,01C0,0A30,0000,1250    ;2373            Q_R[6]
U 1250, 0001,203C,0180,09D8,0000,10AC    ;2374            RC[0B]_Q
U 10AC, 0001,203D,0180,0AC0,0000,100C    ;2375    =0      R[8]_Q,CALL,J/TBWR1      ; WRITE GROUP 1
U 10AD, 0000,003C,0180,6000,0000,1251    ;2376            FS/MCT,MCT/READ.V.NEWPC ; LOAD IPA
U 1251, 0010,0038,0180,0920,0200,1252    ;2377            VA_RC[4]                 ; CHANGE VA TO CATCH BAD MUX SELECTS
U 1252, 0000,003C,0180,F800,0000,1253    ;2378            FS/MCT,MCT/ALLOW.IB.READ         ; LOAD TOAR
U 1253, 0000,003C,69F0,2C00,0000,1254    ;2379            Q_ID[TIME.ADDR]
U 1254, 0000,003C,ED80,0800,0084,7255    ;2380            SC_K[.1B]
U 1255, 0000,003C,0580,0800,0084,9256    ;2381            SC_SC+K[.1]
U 1256, 0803,0010,0180,0800,0000,1257    ;2382            ALU_MASK+1,D_ALU
U 1257, 001D,2024,01C0,09E8,0000,1258    ;2383            ALU_Q[ANDNOT]D,Q_ALU,RC[0D]_ALU
U 1258, 0800,003C,0180,0A38,0000,1259    ;2384            D_R[7]
U 1259, 001D,2000,0180,0800,0010,125A    ;2385            ALU_Q-D,CLK.UBCC
U 125A, 0001,013C,0180,09F0,0000,10AE    ;2386            Z?,RC[0E]_D
U 10AE, 0000,003D,0180,0800,0000,118A    ;2387    =0      ERROR1                   ; TOAR INCORRECT
                                         ;2388    ; SEE IF GROUP 0 IS INTACT.
U 10AF, 0018,0038,D580,09F8,0000,125B    ;2389            RC[0F]_K[.6]
U 125B, 0010,0038,0180,0920,0200,125C    ;2390            VA_RC[4]
U 125C, 0010,0038,0180,09D0,0000,125D    ;2391            RC[0A]_LC
U 125D, 0000,003C,0180,0928,0000,1040    ;2392            LC_RC[5]
U 1040, 0010,0039,0180,0AB8,0000,11BD    ;2393    =000    R[7]_LC,CALL,J/HIT0
U 1041, 0000,003D,0180,0800,0000,118A    ;2394            ERROR1                   ; NON-TB MISS TRAP OCCURRED
U 1042, 0000,003D,0180,0800,0000,118A    ;2395            ERROR1                   ; TB MISS TRAP OCCURRED
U 1043, 0000,003D,0180,0800,0000,118A    ;2396            ERROR1                   ; HIT MISS BITS IN TBER0 INCORRECT
U 1044, 0000,003D,0180,0800,0000,11A2    ;2397            CALL,J/RELCHK
U 1045, 0000,003D,0180,0800,0000,118A    ;2398            ERROR1                   ; UTRAP OCCURRED
U 1046, 0000,003D,0180,0800,0000,118A    ;2399            ERROR1                   ; IPA MUX FAILED (TOAR INCORRECT)
U 1047, 0000,003C,0180,0A20,0010,125E    ;2400            ALU_R[4],CLK.UBCC        ; DONE YET?
U 125E, 0000,013C,0180,0800,0000,10B0    ;2401            Z?
U 10B0, 0018,0000,0580,0AA0,0000,10A1    ;2402    =0      R[4]_LA-K[.1],J/H1PIBB
U 10B1, 0000,003C,0180,0800,0000,10B2    ;2403            NOP
```

```
                                               ;2404          .PAGE   "TEST B4        TB GROUP 0 PTE MEMORY STATIC TEST"
                                               ;2405    ;*************************************************************
                                               ;2406    ;++
                                               ;2407    ; TEST  B4      GROUP 0 PTE MEMORY STATIC TEST
                                               ;2408    ;
                                               ;2409    ; TEST DESCRIPTION
                                               ;2410    ;       THIS IS A STATIC TEST OF THE TB PTE ADDRESS MEMORY.
                                               ;2411    ;       A 1 IS FLOATED ACCROSS A FIELD OF 0'S THROUGH THE ADDRESS
                                               ;2412    ;       PORTION OF THE PTE STORED IN EACH OF THE 64 TB MEMORY LOCATIONS
                                               ;2413    ;       IN GROUP 0.
                                               ;2414    ;
                                               ;2415    ; LOGIC DESCRIPTION
                                               ;2416    ;
                                               ;2417    ; ERROR DESCRIPTION
                                               ;2418    ;       EXPECTED TBERO (OR TBER1 IF UNEXPECTED UTRAP OCCURS)
                                               ;2419    ;       ACTUAL TBERO
                                               ;2420    ;       EXPECTED TIME OUT ADDRESS REGISTER
                                               ;2421    ;       ACTUAL TIME OUT ADDRESS REGISTER
                                               ;2422    ;       VA WRITTEN
                                               ;2423    ;       UTRAP FLAG
                                               ;2424    ;       PTE WRITTEN
                                               ;2425    ;
                                               ;2426    ; SYNC POINT DESCRIPTION
                                               ;2427    ;
                                               ;2428    ;--
                                               ;2429    ;*************************************************************
                                               ;2430    =0
U 10B2, 0000,003D,0180,0800,0000,105B          ;2431    TMEGO:  NEWTST
U 10B3, 0018,0038,5D80,09F8,0000,10B4          ;2432            RC[0F]_K[.7]
U 10B4, 0000,003D,0180,0800,0000,1193          ;2433    =0      CALL,J7CSOFF            ; TURN OFF CACHE AND SBI
U 10B5, 0000,003C,0180,0800,0000,10B6          ;2434            NOP
U 10B6, 0F00,003D,0180,0800,0000,100A          ;2435    =0      D_0,CALL,J/DC.DE
U 10B7, 0001,003C,0180,0AF0,0000,10B8          ;2436            R[0E]_D
U 10B8, 0000,003D,0180,0800,0000,11E7          ;2437    =0      CALL,J/TBWPTP           ; GENERATE TEST PATTERNS
U 10B9, 0000,003C,D980,0800,0084,725F          ;2438            SC_K[.9]
U 125F, 0003,001C,0180,0A80,0000,1260          ;2439            ALU_NOT.MASK,R[0]_ALU
U 1260, 0018,0038,5580,0A98,0000,1261          ;2440            R[3]_K[.3F]             ; SET ADDRESS LOOP COUNTER
U 1261, 0003,003C,0180,0AD0,0000,1262          ;2441            R[0A]_0
U 1262, 0018,0038,2180,0AA0,0000,10BA          ;2442    TMEGOA: R[4]_K[.14]             ; SET BIT LOOP COUNTER
U 10BA, 0000,003D,0180,0800,0000,1189          ;2443    =0      ERLOOP
U 10BB, 0800,003C,0180,0A50,0000,1263          ;2444    TMEGOB: D_R[0A]
U 1263, 0010,0038,01C0,0908,0000,1264          ;2445            Q_RC[1]
U 1264, 001D,0030,0180,0800,0200,1265          ;2446            ALU_D[OR]Q,VA_ALU
U 1265, 0000,003C,0180,0900,0000,10BC          ;2447            LC_RC[0]
U 10BC, 0010,0039,0180,0AC0,0000,1018          ;2448    =0      R[8]_LC,CALL,J/TBWRB    ; WRITE BOTH GROUPS
U 10BD, 0000,003C,0180,0A20,0082,1266          ;2449            SC_R[4]
U 1266, 0000,003C,01C0,0A60,0000,1267          ;2450            Q_R[0C]
U 1267, 0001,201C,01C0,0AB0,0000,1268          ;2451            ALU_Q.ORNOT.MASK,Q_ALU,R[6]_ALU
U 1268, 0800,003C,0180,0A50,0000,1269          ;2452            D_R[0A]
U 1269, 0010,0038,01C0,0938,0000,126A          ;2453            Q_RC[7]
U 126A, 081D,0030,0180,09D0,0200,126B          ;2454            ALU_D[OR]Q,VA_ALU,RC[0A]_ALU,D_ALU
U 126B, 0001,003C,0180,0AA8,0000,10BE          ;2455            R[5]_D
U 10BE, 0000,003D,0180,0800,0000,101A          ;2456    =0      CALL,J/RELSUB           ; SIMULATE TRANSLATION
U 10BF, 0000,003C,01C0,0A30,0000,126C          ;2457            Q_R[6]
U 126C, 0001,203C,0180,09C0,0000,126D          ;2458            RC[8]_Q
```

```
U 126D, 0001,203C,0180,0AC0,0000,10C0   ;2459           R[8]_Q
U 10C0, 0000,003D,0180,0800,0000,1014   ;2460   =0      CALL,J/TBWR0              ; WRITE GROUP 0
U 10C1, 0000,003C,0180,0800,0000,1050   ;2461           NOP
U 1050, 0000,003D,0180,0800,0000,11BD   ;2462   =000    CALL,J/HIT0                        ; SEE IF HIT IN GROUP 0
U 1051, 0000,003D,0180,0800,0000,118A   ;2463           ERROR1                    ; NON TB MISS TRAP OCCURRED
U 1052, 0000,003D,0180,0800,0000,118A   ;2464           ERROR1                    ; TB MISS TRAP OCCURRED
U 1053, 0000,003D,0180,0800,0000,118A   ;2465           ERROR1                    ; HIT MISS BITS IN TBER0 INCORRECT
U 1054, 0000,003D,0180,0800,0000,11A2   ;2466           CALL,J/RELCHK
U 1055, 0000,003D,0180,0800,0000,118A   ;2467           ERROR1                    ; UTRAP OCCURRED
U 1056, 0000,003D,0180,0800,0000,118A   ;2468           ERROR1                    ; TB GROUP 0 DATA INCORRECT
U 1057, 0000,003C,0180,0A20,0010,126E   ;2469           ALU_R[4],CLK.UBCC         ; DONE ALL BITS AT THIS ADDRESS YET
U 126E, 0000,013C,0180,0800,0000,10C2   ;2470           Z?
U 10C2, 0018,0000,0580,0AA0,0000,10BB   ;2471   =0      R[4]_LA-K[.1],J/TMEG0B
U 10C3, 0000,003C,01C0,0A00,0000,126F   ;2472           Q_R[0]
U 126F, 0800,003C,0180,0A50,0000,1270   ;2473           D_R[0A]
U 1270, 081D,0014,0180,0AD0,0000,1271   ;2474           ALU_D+Q,R[0A]_ALU,D_ALU
U 1271, 0000,003C,6180,0800,0084,7272   ;2475           SC_K[.F]
U 1272, 0000,003C,0580,0800,0084,B273   ;2476           SC_SC-K[.1]
U 1273, 0001,0024,0180,0800,0010,1274   ;2477           ALU_D.ANDNOT.MASK,CLK.UBCC
U 1274, 0000,013C,8D80,0800,0084,70C4   ;2478           Z?,SC_K[.1F]
U 10C4, 0003,001C,0180,0AD0,0000,10C5   ;2479   =0      ALU_NOT.MASK,R[0A]_ALU
U 10C5, 0000,003C,0180,0A18,0010,1275   ;2480           ALU_R[3],CLK.UBCC         ; DONE ALL ADDRESSES YET?
U 1275, 0000,013C,0180,0800,0000,10C6   ;2481           Z?
U 10C6, 0018,0000,0580,0A98,0000,1262   ;2482   =0      R[3]_LA-K[.1],J/TMEG0A
U 10C7, 0000,003C,0180,0800,0000,10C8   ;2483           NOP
```

```
                                                  .PAGE   "TEST B5        TB GROUP 1 PTE MEMORY STATIC TEST"
                                         ;***********************************************************
                                         ;++
                                         ; TEST  B5      TB GROUP 1 PTE MEMORY STATIC TEST
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS IS A STATIC TEST OF THE TB PTE ADDRESS MEMORY.
                                         ;       A 1 IS FLOATED ACCROSS A FIELD OF 0'S THROUGH THE ADDRESS
                                         ;       PORTION OF THE PTE STORED IN EACH OF THE 64 TB MEMORY LOCATIONS
                                         ;       IN GROUP 1.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       EXPECTED TBER0 (OR TBER1 IF UNEXPECTED UTRAP OCCURS)
                                         ;       ACTUAL TBER0
                                         ;       EXPECTED TIME OUT ADDRESS REGISTER
                                         ;       ACTUAL TIME OUT ADDRESS REGISTER
                                         ;       VA WRITTEN
                                         ;       UTRAP FLAG
                                         ;       PTE WRITTEN
                                         ;
                                         ; SYNC POINT DESCRIPTION
                                         ;
                                         ;--
                                         ;***********************************************************
                                         =0
U 10C8, 0000,003D,0180,0800,0000,105B    TMEG1:  NEWTST
U 10C9, 0018,0038,5D80,09F8,0000,10CA            RC[0F]_K[.7]
U 10CA, 0000,003D,0180,0800,0000,1193    =0      CALL,J/CSOFF            ; TURN OFF CACHE AND SBI
U 10CB, 0000,003C,0180,0800,0000,10CC            NOP
U 10CC, 0F00,003D,0180,0800,0000,100A    =0      D_0,CALL,J/DC.DE
U 10CD, 0001,003C,0180,0AF0,0000,10CE            R[0E]_D
U 10CE, 0000,003D,0180,0800,0000,11E7    =0      CALL,J/TBWPTP                   ; GENERATE TEST PATTERNS
U 10CF, 0000,003C,D980,0800,0084,7276            SC_K[.9]
U 1276, 0003,001C,0180,0A80,0000,1277            ALU_NOT.MASK,R[0]_ALU
U 1277, 0018,0038,5580,0A98,0000,1278            R[3]_K[.3F]             ; SET ADDRESS LOOP COUNTER
U 1278, 0003,003C,0180,0AD0,0000,1279            R[0A]_0
U 1279, 0016,0038,2180,0AA0,0000,10D0    TMEG1A: R[4]_K[.14]             ; SET BIT LOOP COUNTER
U 10D0, 0000,003D,0180,0800,0000,1189    =0      ERLOOP
U 10D1, 0800,003C,0180,0A50,0000,127A    TMEG1B: D_R[0A]
U 127A, 0010,0038,01C0,0908,0000,127B            Q_RC[1]
U 127B, 001D,0030,0180,0800,0200,127C            ALU_D[OR]Q,VA_ALU
U 127C, 0000,003C,0180,0900,0000,10D2            LC_RC[0]
U 10D2, 0010,0039,0180,0AC0,0000,1018    =0      R[8]_LC,CALL,J/TBWRB            ; WRITE BOTH GROUPS
U 10D3, 0000,003C,0180,0A20,0082,127D            SC_R[4]
U 127D, 0000,003C,01C0,0A60,0000,127E            Q_R[0C]
U 127E, 0001,201C,01C0,0AB0,0000,127F            ALU_Q.ORNOT.MASK,Q_ALU,R[6]_ALU
U 127F, 0800,003C,0180,0A50,0000,1280            D_R[0A]
U 1280, 0010,0038,01C0,0938,C000,1281            Q_RC[7]
U 1281, 081D,0030,0180,09D0,0200,1282            ALU_D[OR]Q,VA_ALU,D_ALU,RC[0A]_ALU
U 1282, 0001,003C,0180,0AA8,0000,10D4            R[5]_D
U 10D4, 0000,003D,0180,0800,0000,101A    =0      CALL,J/RELSUB           ; SIMULATE RELOCATION
U 10D5, 0000,003C,01C0,0A30,0000,1283            Q_R[6]
U 1283, 0001,203C,0180,09C0,0000,1284            R[8]_Q
```

```
U 1284, 0001,203C,0180,0AC0,0000,10D6    ;2539           R[8]_Q
U 10D6, 0000,003D,0180,0800,0000,100C    ;2540   =0      CALL,J/TBWR1              ; WRITE GROUP 1
U 10D7, 0000,003C,0180,0800,0000,1060    ;2541           NOP
U 1060, 0000,003D,0180,0800,0000,11CA    ;2542   =000    CALL,J/HIT1               ; SEE IF HIT IN GROUP 1
U 1061, 0000,003D,0180,0800,0000,118A    ;2543           ERROR1                    ; NON TB MISS TRAP OCCURRED
U 1062, 0000,003D,0180,0800,0000,118A    ;2544           ERROR1                    ; TB MISS TRAP OCCURRED
U 1063, 0000,003D,0180,0800,0000,118A    ;2545           ERROR1                    ; HIT MISS BITS IN TBERO INCORRECT
U 1064, 0000,003D,0180,0800,0000,11A2    ;2546           CALL,J/RELCHK
U 1065, 0000,003D,0180,0800,0000,118A    ;2547           ERROR1                    ; UTRAP OCCURRED
U 1066, 0000,003D,0180,0800,0000,118A    ;2548           ERROR1                    ; TB GROUP 1 DATA MEMORY FAILED
U 1067, 0000,003C,0180,0A20,0010,1285    ;2549           ALU_R[4],CLK.UBCC         ; DONE ALL BITS AT THIS ADDRESS YET?
U 1285, 0000,013C,0180,0800,0000,10D8    ;2550           Z?
U 10D8, 0018,0000,0580,0AA0,0000,10D1    ;2551   =0      R[4]_LA-K[.1],J/TMEG1B
U 10D9, 0000,003C,01C0,0A00,0000,1286    ;2552           Q_R[0]
U 1286, 0800,003C,0180,0A50,0000,1287    ;2553           D_R[0A]
U 1287, 081D,0014,0180,0AD0,0000,1288    ;2554           ALU_D+Q,R[0A]_ALU,D_ALU
U 1288, 0000,003C,6180,0800,0084,7289    ;2555           SC_K[.F]
U 1289, 0000,003C,0580,0800,0084,B28A    ;2556           SC_SC-K[.1]
U 128A, 0001,0024,0180,0800,0010,128B    ;2557           ALU_D.ANDNOT.MASK,CLK.UBCC
U 128B, 0000,013C,8D80,0800,0084,70DA    ;2558           Z?,SC_K[.1F]
U 10DA, 0003,001C,0180,0AD0,0000,10DB    ;2559   =0      ALU_NOT.MASK,R[0A]_ALU
U 10DB, 0000,003C,0180,0A18,0010,128C    ;2560           ALU_R[3],CLK.UBCC                 ; DONE WITH ALL ADDRESSES YET?
U 128C, 0000,013C,0180,0800,0000,10DC    ;2561           Z?
U 10DC, 0018,0000,0580,0A98,0000,1279    ;2562   =0      R[3]_LA-K[.1],J/TMEG1A
U 10DD, 0000,003C,0180,0800,0000,10DE    ;2563           NOP
```

```
                                                  .PAGE   "TEST B6        TB GROUP 0 TAG MEMORY STATIC TEST"
                                          ;*****************************************************************
                                          ;++
                                          ; TEST  B6      TB GROUP 0 TAG MEMORY STATIC TEST
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS IS A TEST OF THE ADDRESS (TAG) MEMORY OF THE
                                          ;       TB. HERE A STATIC TEST IS PERFORMED BY FLOATING
                                          ;       A 1 THROUGH 0'S IN THE VA <30:14> WHICH IS
                                          ;       WRITTEN INTO EACH OF THE 64 LOCATIONS OF TB GROUP 0.
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       EXPECTED TBER0 (OR TBER1 IF UNEXPECTED UTRAP OCCURS)
                                          ;       ACTUAL TBER0
                                          ;       EXPECTED TIME OUT ADDRESS REGISTER
                                          ;       ACTUAL TIME OUT ADDRESS REGISTER
                                          ;       VA WRITTEN
                                          ;       UTRAP FLAG
                                          ;
                                          ; SYNC POINT DESCRIPTION
                                          ;
                                          ;--
                                          ;*****************************************************************
                                          =0
U 10DE, 0000,003D,0180,0800,0000,105B     TBADG0: NEWTST
U 10DF, 0018,0038,D580,09F8,0000,10E0             RC[0F]_K[.6]
U 10E0, 0000,003D,0180,0800,0000,1193     =0      CALL,J7CSOFF                    ; TURN OFF CACHE AND SBI
U 10E1, 0000,003C,0180,0800,0000,10E2             NOP
U 10E2, 0F00,003D,0180,0800,0000,100A     =0      D_0,CALL,J/DC.DE
U 10E3, 0001,003C,0180,0AF0,0000,10E4             R[0E]_D
U 10E4, 0000,003D,0180,0800,0000,11E7     =0      CALL,J/TBWPTP          ; GENERATE TEST PATTERNS
U 10E5, 0003,003C,0180,0A88,0000,128D             R[1]_0
U 128D, 0818,0038,6180,0800,0000,128E             D_K[.F]
U 128E, 0019,0000,0580,0AC8,0000,128F             ALU_D-K[.1],R[9]_ALU
U 128F, 0000,003C,D980,0800,0084,7290             SC_K[.9]
U 1290, 0003,001C,0180,0A80,0000,1291             ALU_NOT.MASK,R[0]_ALU
U 1291, 0018,0038,5580,0A98,0000,1292             R[3]_K[.3F]                     ; SET ADDRESS COUNTER
U 1292, 0018,0038,6580,0AA0,0000,10E6     TAFG0A: R[4]_K[.10]            ; SET BIT LOOP COUNTER
U 10E6, 0000,003D,0180,0800,0000,1189     =0      ERLOOP
U 10E7, 080C,003C,0180,0A08,0000,1293     TAFG0B: D_R[1]
U 1293, 0010,0038,01C0,0938,0000,1294             Q_RC[7]
U 1294, 001D,0030,0180,0800,0200,1295             ALU_D[OR]Q,VA_ALU
U 1295, 0000,003C,0180,0930,0000,10E8             LC_RC[6]
U 10E8, 0010,0039,0180,0AC0,0000,1018     =0      R[8]_LC,CALL,J/TBWRB            ; WRITE BOTH GROUPS
U 10E9, 0800,003C,0180,0A20,0000,1296             D_R[4]
U 1296, 0000,003C,0180,0A48,0000,1297             LAB_R[9]
U 1297, 001C,2014,0180,0800,0082,1298             ALU_LA[A+B]D,SC_ALU
U 1298, 0800,003C,0180,0A08,0000,1299             D_R[1]
U 1299, 0001,001C,0180,09D0,0200,129A             ALU_D.ORNOT.MASK,VA_ALU,RC[0A]_ALU
U 129A, 0000,003C,0180,0900,0000,129B             LC_RC[0]
U 129B, 0010,0038,0180,0AC0,0000,129C             R[8]_LC
U 129C, 0000,003C,0180,0910,0000,10EA             LC_RC[2]
U 10EA, 0010,0039,0180,0AB8,0000,1014     =0      R[7]_LC,CALL,J/TBWR0                     ; WRITE GROUP 0
```

```
U 10EB, 0000,003C,0180,0800,0000,1068   ;2619           NOP
U 1068, 0000,003D,0180,0800,0000,11BD   ;2620   =000    CALL,J/HIT0                ; SEE IF HIT IN GROUP 0
U 1069, 0000,003D,0180,0800,0000,118A   ;2621           ERROR1                     ; NON TB MISS TRAP OCCURRED
U 106A, 0000,003D,0180,0800,0000,118A   ;2622           ERROR1                     ; TB MISS TRAP OCCURRED
U 106B, 0000,003D,0180,0800,0000,118A   ;2623           ERROR1                     ; HIT MISS BITS IN TBER0 INCORRECT
U 106C, 0000,003D,0180,0800,0000,11A2   ;2624           CALL,J/RELCHK
U 106D, 0000,003D,0180,0800,0000,118A   ;2625           ERROR1                     ; UTRAP OCCURRED
U 106E, 0000,003D,0180,0800,0000,118A   ;2626           ERROR1                     ; GROUP 0 TAG MEMORY FAILED
U 106F, 0000,003C,0180,0A20,0010,129D   ;2627           ALU_R[4],CLK.UBCC                   ; DONE ALL BITS AT THIS ADDRESS YET?
U 129D, 0000,013C,0180,0800,0000,10EC   ;2628           Z?
U 10EC, 0018,0000,0580,0AA0,0000,10E7   ;2629   =0      R[4]_LA-K[.1],J/TAFG0B
U 10ED, 0000,003C,01C0,0A00,0000,129E   ;2630           Q_R[0]
U 129E, 0800,003C,0180,0A08,0000,129F   ;2631           D_R[1]
U 129F, 081D,2014,0180,0A88,0000,12A0   ;2632           ALU_Q+D,R[1]_ALU,D_ALU
U 12A0, 0000,003C,6180,0800,0084,72A1   ;2633           SC_K[.F]
U 12A1, 0000,003C,0580,0800,0084,B2A2   ;2634           SC_SC-K[.1]
U 12A2, 0001,0024,0180,0800,0010,12A3   ;2635           ALU_D.ANDNOT.MASK,CLK.UBCC
U 12A3, 0000,013C,8D80,0800,0084,70EE   ;2636           Z?,SC_K[.1F]
U 10EE, 0003,001C,0180,0A88,0000,10EF   ;2637   =0      ALU_NOT MASK,R[1]_ALU
U 10EF, 0000,003C,0180,0A18,0010,12A4   ;2638           ALU_R[3],CLK.UBCC                   ; DONE ALL ADDRESSES YET?
U 12A4, 0000,013C,0180,0800,0000,10F0   ;2639           Z?
U 10F0, 0018,0000,0580,0A98,0000,1292   ;2640   =0      R[3]_LA-K[.1],J/TAFG0A
U 10F1, 0000,003C,0180,0800,0000,10F2   ;2641           NOP
```

```
                                                .PAGE   "TEST B7        TB GROUP 1 TAG MEMORY STATIC TEST"
                                        ;*****************************************************************
                                        ;++
                                        ; TEST  B7      TB TAG MEMORY STATIC TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF THE ADDRESS (TAG) MEMORY OF THE
                                        ;       TB. HERE A STATIC TEST IS PERFORMED BY FLOATING
                                        ;       A 1 THROUGH 0'S IN THE VA <30:14> WHICH IS
                                        ;       WRITTEN INTO EACH OF THE 64 LOCATIONS OF TB GROUP 1.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED TBER0 (OR TBER1 IF UNEXPECTED UTRAP OCCURS)
                                        ;       ACTUAL TBER0
                                        ;       EXPECTED TIME OUT ADDRESS REGISTER
                                        ;       ACTUAL TIME OUT ADDRESS REGISTER
                                        ;       VA WRITTEN
                                        ;       UTRAP FLAG
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;
                                        ;--
                                        ;*****************************************************************
                                        =0
U 10F2, 0000,003D,0180,0800,0000,105B   TBADG1: NEWTST
U 10F3, 0018,0038,D580,09F8,0000,10F4           RC[0F]_K[.6]
U 10F4, 0000,003D,0180,0800,0000,1193   =0      CALL,J7CSOFF            ; TURN OFF CACHE,SBI
U 10F5, 0000,003C,0180,0800,0000,10F6           NOP
U 10F6, 0F00,003D,0180,0800,0000,100A   =0      D_0,CALL,J/DC.DE
U 10F7, 0001,003C,0180,0AF0,0000,10F8           R[0E]_D
U 10F8, 0000,003D,0180,0800,0000,11E7   =0      CALL,J/TBWPTP           ; GENERATE TEST PATTERNS
U 10F9, 0003,003C,0180,0A88,0000,12A5           R[1]_0
U 12A5, 0818,0038,6180,0800,0000,12A6           D_K[.F]
U 12A6, 0019,0000,0580,0AC8,0000,12A7           A[U_D-K[.1],R[9]_ALU
U 12A7, 0000,003C,D980,0800,0084,72A8           SC_R[.9]
U 12A8, 0003,001C,0180,0A80,0000,12A9           ALU_NOT.MASK,R[0]_ALU
U 12A9, 0018,0038,5580,0A98,0000,12AB           R[3]_K[.3F]             ; SET ADDRESS LOOP COUNTER
U 12AB, 0018,0038,6580,0AA0,0000,10FA   TAFG1A: R[4]_K[.10]             ; SET BIT LOOP COUNTER
U 10FA, 0000,003D,0180,0800,0000,1189   =0      ERLOOP
U 10FB, 0800,003C,0180,0A08,0000,12AC   TAFG1B: D_R[1]
U 12AC, 0010,0038,01C0,0938,0000,12AD           Q_RC[7]
U 12AD, 001D,0030,0180,0800,0200,12AE           A[U_D[OR]Q,VA_ALU
U 12AE, 0000,003C,0180,0930,0000,10FC           LC_RC[6]
U 10FC, 0010,0039,0180,0AC0,0000,1018   =0      R[8]_LC,CALL,J/TBWRB            ; WRITE BOTH GROUPS
U 10FD, 0800,003C,0180,0A20,0000,12AF           D_R[4]
U 12AF, 0000,003C,0180,0A48,0000,12B0           LAB_R[9]
U 12B0, 001C,2014,0180,0800,0082,12B1           ALU_LA[A+B]D,SC_ALU
U 12B1, 0800,003C,0180,0A08,0000,12B2           D_R[1]
U 12B2, 0001,001C,0180,09D0,0200,12B3           A[U_D.ORNOT.MASK,VA_ALU,RC[0A]_ALU
U 12B3, 0000,003C,0180,0900,0000,12B4           LC_RC[0]
U 12B4, 0010,0038,0180,0AC0,0000,12B5           R[8]_LC
U 12B5, 0000,003C,0180,0910,0000,10FE           LC_RC[2]
U 10FE, 0010,0039,0180,0AB8,0000,100C   =0      R[7]_LC,CALL,J/TBWR1            ; WRITE GROUP 1
```

```
U 10FF, 0000,003C,0180,0800,0000,1070   ;2697           NOP
U 1070, 0000,003D,0180,0800,0000,11CA   ;2698   =000    CALL,J/HIT1                     ; SEE IF HIT IN GROUP 1
U 1071, 0000,003D,0180,0800,0000,118A   ;2699           ERROR1                          ; NON TB MISS TRAP OCCURRED
U 1072, 0000,003D,0180,0800,0000,118A   ;2700           ERROR1                          ; TB MISS TRAP OCCURRED
U 1073, 0000,003D,0180,0800,0000,118A   ;2701           ERROR1                          ; HIT MISS BITS IN TBER0 INCORRECT
U 1074, 0000,003D,0180,0800,0000,11A2   ;2702           CALL,J/RELCHK
U 1075, 0000,003D,0180,0800,0000,118A   ;2703           ERROR1                          ; UTRAP OCCURRED
U 1076, 0000,003D,0180,0800,0000,118A   ;2704           ERROR1                          ; GROUP 1 TAG MEMORY FAILED
U 1077, 0000,003C,0180,0800,0000,12B6   ;2705           NOP
U 12B6, 0000,003C,0180,0A20,0010,12B7   ;2706           ALU_R[4],CLK.UBCC
U 12B7, 0000,013C,0180,0800,0000,110A   ;2707           Z?
U 110A, 0018,0000,0580,0AA0,0000,10FB   ;2708   =0      R[4]_LA-K[.1],J/TAFG1B
U 110B, 0000,003C,01C0,0A00,0000,12B8   ;2709           Q_R[0]
U 12B8, 0800,003C,0180,0A08,0000,12B9   ;2710           D_R[1]
U 12B9, 081D,2014,0180,0A88,0000,12BA   ;2711           ALU_Q+D,R[1]_ALU,D_ALU
U 12BA, 0000,003C,6180,0800,0084,72BB   ;2712           SC_K[.F]
U 12BB, 0000,003C,0580,0800,0084,B2BC   ;2713           SC_SC-K[.1]
U 12BC, 0001,0024,0180,0800,0010,12BD   ;2714           ALU_D.ANDNOT.MASK,CLK.UBCC
U 12BD, 0000,013C,8D80,0800,0084,7110   ;2715           Z?,SC_K[.1F]
U 1110, 0003,001C,0180,0A88,0000,1111   ;2716   =0      ALU_NOT.MASK,R[1]_ALU
U 1111, 0000,003C,0180,0A18,0010,12BE   ;2717           ALU_R[3],CLK.UBCC
U 12BE, 0000,013C,0180,0800,0000,1112   ;2718           Z?
U 1112, 0018,0000,0580,0A98,0000,12AB   ;2719   =0      R[3]_LA-K[.1],J/TAFG1A
U 1113, 0000,003C,0180,0800,0000,1114   ;2720           NOP
```

```
                                          .PAGE   "TEST B8        DUAL ADDRESSING TEST OF TRANSLATION BUFFER ADDRESS M
                                          ;***********************************************************************
                                          ;++
                                          ;
                                          ; TEST  B8     DUAL ADDRESSING TEST OF TRANSLATION BUFFER ADDRESS MATRIX
                                          ;
                                          ; TEST DESCRIPTION
                                          ;
                                          ;      THIS TEST PERFORMS A CURSORY CHECK OF THE ADDRESS LINES TO THE
                                          ;      TRANSLATION BUFFER ADDRESS MATRIX. THIS IS DONE WITH THE
                                          ;      FOLLOWING SEQUENCE:
                                          ;
                                          ;      1) VALIDATE ADDRESS 0           3) VALIDATE ADDRESS 400
                                          ;         VALIDATE ADDRESS 7FFFC200       VALIDATE ADDRESS 7FFFC800
                                          ;         CHECK ADDRESS 0 FOR VALID       CHECK ADDRESS 400 FOR VALID
                                          ;                                         CHECK ADDRESS 200 FOR VALID
                                          ;      2) VALIDATE ADDRESS 200            CHECK ADDRESS 0 FOR VALID
                                          ;         VALIDATE ADDRESS 7FFFC400
                                          ;         CHECK ADDRESS 200 FOR VALID  4) ETC...
                                          ;         CHECK ADDRESS 0 FOR VALID
                                          ;
                                          ;      THE WRITE BOTH BIT IS SET IN TBERO SO THAT BOTH GROUPS CAN BE
                                          ;      CHECKED AT THE SAME TIME.
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;
                                          ;      THIS TEST CHECKS TRANSLATION BUFFER TAG MEMORY ON THE CAM MODULE.
                                          ;
                                          ; ERROR DESCRIPION
                                          ;
                                          ;      DATA: ADDRESS VALIDATED AS ONE'S (7FFFC200, 7FFFC400, ETC.)
                                          ;            ADDRESS BEING CHECK FOR ZERO'S (0,200,400,800,1000, ETC.)
                                          ;            EXPECTED TB HIT/MISS BITS
                                          ;            RECEIVED TB HIT/MISS BITS
                                          ;--
                                          ;***********************************************************************
                                          =0
U 1114, 0018,0039,1180,09F8,0000,105B     T004:   NEWTST[.4]
U 1115, 0818,0038,65F8,0800,0084,72BF             D_K[.10],SC_K[.10],Q_0        ; GENERATE DATA FOR TBERO
U 12BF, 0D00,003C,0180,0800,0000,12C0             D_DAL.SC                      ; WRITE BOTH BIT
U 12C0, 0000,003C,4980,3C00,0000,12C1             ID[TBERO]_D                   ; LOAD THE TBERO REGISTER
U 12C1, 0818,0038,C180,0800,0000,12C2             D_K[.FFFF]                    ; GENERATE THE INITIAL ADDRESS
U 12C2, 0500,003C,8980,0800,0084,72C3             D_D.LEFT,SC_K[.D]             ; THAT GETS WRITTEN WITH ALL
U 12C3, 0819,0030,05F8,0800,0084,92C4             D_D.OR.K[.1],SC_SC+K[.1].Q_0  ; ONE'S
U 12C4, 0D00,003C,D980,0800,0084,72C5             D_DAL.SC,SC_K[.9]
U 12C5, 0801,001C,0180,0800,0000,12C6             D_D.ORNOT.MASK
U 12C6, 0001,003C,0180,09F0,0000,12C7             R[0E]_D                       ; EQUALS 7FFFFC200
U 12C7, 0003,003C,0180,0A80,0000,12C8             R[0]_0                        ; INIT ADDRESS THAT GETS WRITTEN AS ZERO'S
U 12C8, 0818,0038,8D80,0800,0000,12C9             D_K[.1F]                      ; GENERATE MASK FOR TAG BITS
U 12C9, 0D00,003C,0180,0800,0000,12CA             D_DAL.SC                      ; EQUALS 3E00
U 12CA, 0001,003C,0180,0980,0000,12CB             R[0]_D
U 12CB, 0018,0038,D180,09E0,0000,1116             R[0C]_K[.C0]                  ; SET EXPECTED HIT/MISS BITS
U 1116, 0000,003D,0180,0800,0000,1189     =0      ERLOOP
U 1117, 0000,003C,0180,0A00,0200,12CC     LOOPM:  VA_ALU,ALU_R[0]               ; LOAD ADDRESS TO WRITE ZERO'S
U 12CC, 0000,003C,8D80,0800,0084,72CD             SC_K[.1F]
```

```
U 12CD, 0803,001C,0180,0800,0000,12CE   ;2776           D_NOT.MASK                      ; GET PTE VALID BIT
U 12CE, 0000,003C,4180,3C00,0000,12CF   ;2777           ID[TBUF]_D                      ; LOAD THE TB
U 12CF, 0010,0038,0180,0970,0200,12D0   ;2778           VA_ALU,A[U_RC[OE]               ; LOAD ADDRESS TO WRITE ALL ONE'S
U 12D0, 0010,0038,41C0,3D70,0000,12D1   ;2779           Q_RC[OE],ID[TBUF]_D             ; LOAD THE TB
                                        ;2780                                           ; GET FIRST ADDRESS WITH ALL ZERO'S
U 12D1, 0011,2034,01C0,0900,0010,12D2   ;2781           Q_Q.AND.RC[O],CLK.UBCC          ; IS 3IT 31 SET?
U 12D2, 0000,013C,0180,0800,0000,1118   ;2782           Z?                              ; BRANCH IF YES
U 1118, 0000,003C,0180,0800,0000,12D4   ;2783   =0      J/LOOPN                         ; CONTINUE
U 1119, 0000,003C,8980,0800,0084,72D3   ;2784           SC_K[.D]                        ; FIRST ADDRESS HAS BIT 13 SET
U 12D3, 0003,001C,8DC0,0800,0034,72D5   ;2785           Q_NOT.MASK,SC_K[.1F],J/NOSHIFT  ; SET BIT 13 AND CONTINUE
U 12D4, 0000,003C,01B0,0800,0000,12D5   ;2786   LOOPN:  Q_Q.RIGHT
U 12D5, 0011,2034,01C0,0900,0200,12D6   ;2787   NOSHIFT:Q_Q.AND.RC[O],VA_ALU            ; LOAD THE ADDRESS
U 12D6, 0001,203C,0180,09E8,0000,12D7   ;2788           RC[OD]_Q                        ; SAVE IT
U 12D7, 0000,003C,49F0,2C00,0000,12D8   ;2789           Q_ID[TBERO]                     ; READ THE HIT/MISS BITS
U 12D8, 0011,2034,01C0,0960,0000,12D9   ;2790           Q_Q.AND.RC[OC]                  ; MASK THEM
U 12D9, 0011,2000,0180,0800,0010,12DA   ;2791           A[U_Q-LC,CLK.UBCC               ; CHECK FOR HIT IN BOTH GROUPS
U 12DA, 0000,013C,0180,0800,0000,111A   ;2792           Z?
U 111A, 0001,203D,0180,09D8,0000,118C   ;2793   =0      ERROR2,RC[OB]_Q                 ; DID NOT GET HIT IN BOTH GROUPS
U 111B, 0010,0038,01C0,0968,0010,12DB   ;2794           Q_RC[OD],CLK.UBCC               ; MOF.E ADDRESSES TO CHECK?
U 12DB, 0000,013C,0180,0800,0000,111C   ;2795           Z?
U 111C, 0000,003C,0180,0800,0000,12D4   ;2796   =0      J/LOOPN                         ; YES
U 111D, 0810,0038,0180,0970,0010,12DC   ;2797           D_RC[OE],CLK.UBCC               ; IS BIT 31 SET IN ADR WITH ALL ONE'S?
U 12DC, 0000,1B3C,0180,0800,0000,1017   ;2798           A[U.N?
U 1017, 0000,003C,0180,0800,0000,12DD   ;2799   =0111   J/NEXTADDRESS                   ; BIT 31 NOT SET YET
U 101F, 0000,003C,0180,0800,0000,12E3   ;2800           J/ENDT004                       ; DONE WITH TEST
                                        ;2801   NEXTADDRESS:
U 12DD, 0811,0034,0180,0900,0000,12DE   ;2802           D_D[AND]RC[O]                   ; GET TAG FIELD OF ADDRESS WITH ALL ONE'S
U 12DE, 0501,003C,0180,0A80,0000,12DF   ;2803           R[O]_D,D_D.LEFT                 ; SET NE ADDRESS TO WRITE ALL ZERO'S
U 12DF, 0011,0034,0180,0900,0010,12E0   ;2804           ALU_D[AND]RC[O],CLK.UBCC        ; TIME TO SET BIT 31?
U 12E0, 0010,0138,01C0,0970,0000,111E   ;2805           Z?,Q_RC[OE]
U 111E, 0000,003C,0180,0800,0000,12E1   ;2806   =0      J/NOTBIT31
U 111F, 0803,001C,0180,0800,0000,12E1   ;2807           D_NOT.MASK                      ; GET BIT 31
                                        ;2808   NOTBIT31:
U 12E1, 0011,2024,01C0,0900,0000,12E2   ;2809           Q_Q.ANDNOT.RC[O]                ; GET THE ALL ONE'S
U 12E2, 001D,0030,0180,09F0,0000,1117   ;2810           RC[OE]_D.OR.Q,J/LOOPM           ; CONTINUE TEST
U 12E3, 0000,003C,0180,0800,0000,1120   ;2811   ENDT004:NOP
```

```
                                                .PAGE   ''TEST B9       DUAL ADDRESSING TEST OF TRANSLATION BUFFER DATA MATR
                                        ;******************************************************************************
                                        ;++
                                        ;
                                        ; TEST  B9      DUAL ADDRESSING TEST OF TRANSLATION BUFFER DATA MATRIX
                                        ;
                                        ; TEST DESCRIPTION
                                        ;
                                        ;       THIS TEST PERFORMS A CURSORY CHECK OF THE ADDRESS LINES TO THE
                                        ;       TRANSLATION BUFFER DATA MATRIX (PTE). THIS IS DONE WITH THE
                                        ;       FOLLOWING SEQUENCE:
                                        ;
                                        ;       1) WRITE 0 TO ADDRESS 0         3) WRITE 0 TO ADDRESS 400
                                        ;          WRITE 1 TO ADDRESS 200          WRITE 1 TO ADDRESS 800
                                        ;          CHECK ADDRESS 0 FOR 0           CHECK ADDRESS 400 FOR 0
                                        ;                                          CHECK ADDRESS 200 FOR 0
                                        ;       2) WRITE 0 TO ADDRESS 200          CHECK ADDRESS 0 FOR 0
                                        ;          WRITE 1 TO ADDRESS 400
                                        ;          CHECK ADDRESS 200 FOR 0      4) ETC...
                                        ;          CHECK ADDRESS 0 FOR 0
                                        ;
                                        ;       THE TB IS ENABLED FOR THIS TEST BUT A REFERANCE DOES NOT HAVE TO
                                        ;       BE MADE SINCE THE PA BUS WILL HAVE THE TRANSLATED ADDRESS ON IT
                                        ;       THE CYCLE AFTER THE VA IS LOADED.
                                        ;
                                        ;       THE CHECK OF THE ADDRESSES IS MADE BY READING THE TIMEOUT ADDRESS
                                        ;       REGISTER AND CHECKING IT FOR ZERO.
                                        ;
                                        ;       SUBTEST 1 - CHECK THE DATA MATRIX FOR GROUP 0
                                        ;
                                        ;       SUBTEST 2 - CHECK THE DATA MATRIX FOR GROUP 1
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;
                                        ;       THIS TEST CHECKS THE ADDRESS LINES TO THE TB DATA MATRIX ON THE
                                        ;       TBM MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;
                                        ;       DATA: ADDRESS WRITTEN WITH A PTE OF ALL ONE'S
                                        ;             ADDRESS BEING CHECKED FOR A PTE OF ALL ZERO'S
                                        ;             EXPECTED PTE (TIMEOUT ADDRESS REGISTER)
                                        ;             RECEIVED PTE (TIMEOUT ADDRESS REGISTER)
                                        ;--
                                        ;******************************************************************************
                                        =0
U 1120, 0018,0039,1180,09F8,0000,105B   T005:   NEWTST[.4]
U 1121, 0818,0038,8D80,0800,0000,12E4           D_K[.1F]                        ; GENERATE A MASK FOR THE TAG BITS
U 12E4, 0000,003C,D9F8,0800,0084,72E5           SC_K[.9],Q_0
U 12E5, 0D00,003C,0180,0800,0000,12E6           D_DAL.SC
U 12E6, 0001,003C,0180,0980,0000,1122           RC[0]_D                         ; EQUALS 3E00
                                        ;//////////////////////////////////////////////////////////////////////////////
                                        ;+
                                        ; CHECK GROUP 0
                                        ;-
```

```
U 1122, 0000,003D,018C,0800,0000,118E   ;2867   =0      SUBTEST
U 1123, 0818,0038,0980,0800,0000,12E7   ;2868           D_K[.2]                         ; GENERATE INITIAL ADDRESS
U 12E7, 0000,003C,01F8,0800,0084,72E8   ;2869           SC_K[.8],Q_0                    ; TO WRITE A PTE OF ALL ONE'S
U 12E8, 0D00,003C,0180,0800,0000,12E9   ;2870           D_DAL.SC
U 12E9, 0001,003C,1180,09F0,0084,72EA   ;2871           RC[0E]_D,SC_K[.4]               ; EQUALS 200
U 12EA, 0003,003C,0580,0A80,0084,92EB   ;2872           R[0]_0,SC_SC+K[.1]              ; SET ADDRESS TO WRITE A PTE OF ZERO'S
U 12EB, 0818,0038,C180,0800,0000,12EC   ;2873           D_K[.FFFF]                      ; GENERATE THE PTE OF ALL ONE'S
U 12EC, 0D00,003C,8D80,0800,0084,72ED   ;2874           D_DAL.SC,SC_K[.1F]              ; ...
U 12ED, 0801,001C,0180,0800,0000,12EE   ;2875           D_D.ORNOT.MASK                  ; INSERT THE VALID BIT
U 12EE, 0019,0030,4980,0A88,0000,12EF   ;2876           R[1]_D.OR.K[.FF]                ; PTE EQUALS 801FFFFF
U 12EF, 0818,0038,B980,0800,0000,12F0   ;2877           D_K[.19]                        ; GENERATE DATA FOR TBERO TO FORCE
U 12F0, 0819,0000,0D80,0800,0000,12F1   ;2878           D_D-K[.3]                       ; MISS G1 AND FORCE REPLACE G0
U 12F1, 0000,003C,65F8,0800,0084,72F2   ;2879           SC_K[.10],Q_0                   ; AND THE WRITE BOTH BIT
U 12F2, 0D00,003C,0180,0800,0000,12F3   ;2880           D_DAL.SC
U 12F3, 0819,0030,0580,0800,0000,12F4   ;2881           D_D.OR.K[.1]
U 12F4, 0000,003C,4980,3C00,0000,12F5   ;2882           ID[TBER0]_D                     ; LOAD THE REGISTER
U 12F5, 0003,003C,0180,09E0,0000,1124   ;2883           RC[0C]_0                        ; SET THE EXPECTED PTE
U 1124, 0000,003D,0180,0800,0000,1189   ;2884   =0      ERLOOP
U 1125, 0000,003C,0180,0A00,0200,12F6   ;2885   LOOP0:  VA_ALU,ALU_R[0]                 ; LOAD ADR TO WRITE ZERO'S
U 12F6, 0000,003C,8D80,0800,0084,72F7   ;2886           SC_K[.1F]
U 12F7, 0803,001C,0180,0800,0000,12F8   ;2887           D_NOT.MASK                      ; GET PTE
U 12F8, 0000,003C,4180,3C00,0000,12F9   ;2888           ID[TBUF]_D                      ; LOAD THE PTE
U 12F9, 0010,0038,0180,0970,0200,12FA   ;2889           VA_ALU,ALU_RC[0E]               ; LOAD ADDRESS TO WRITE ALL ONE'S
U 12FA, 0800,003C,0180,0A08,0000,12FB   ;2890           D_R[1]                          ; GET THE PTE
U 12FB, 0010,0038,41C0,3D70,0000,12FC   ;2891           Q_RC[0E],ID[TBUF]_D             ; LOAD THE PTE
U 12FC, 0011,2034,01C0,0900,0010,12FD   ;2892           Q_Q.AND.RC[0],CLK.UBCC          ; IS BIT 31 SET?
U 12FD, 0000,013C,0180,0800,0000,1126   ;2893           Z?
U 1126, 0000,003C,0180,0800,0000,12FF   ;2894   =0      J/LOOPP                         ; BRANCH IF NO
U 1127, 0000,003C,8980,0800,0084,72FE   ;2895           SC_K[.D]                        ; ADDRESS OF ZERO'S IS 2000
U 12FE, 0003,001C,8DC0,0800,0084,7300   ;2896           Q_NOT.MASK,SC_K[.1F],J/NOSHIFT1 ;
U 12FF, 0000,003C,01B0,0800,0000,1300   ;2897   LOOPP:  Q_Q.RIGHT
                                        ;2898   NOSHIFT1:
U 1300, 0011,2034,01C0,0900,0200,1301   ;2899           Q_Q.AND.RC[0],VA_ALU            ; LOAD ADR OF PTE OF ZERO'S
U 1301, 0001,203C,0180,09E8,0000,1302   ;2900           RC[0D]_Q                        ; SAVE IT
U 1302, 0000,003C,69F0,2C00,0000,1303   ;2901           Q_ID[TIME.ADDR]                 ; READ THE PTE
U 1303, 0001,203C,0180,0800,0010,1304   ;2902           ALU_Q,CLK.UBCC                  ; IS IT ZERO?
U 1304, 0000,013C,0180,0800,0000,1128   ;2903           Z?
U 1128, 0001,203D,0180,09D8,0000,118C   ;2904   =0      ERROR2,RC[0B]_Q                 ; PTE IS INCORRECT
U 1129, 0010,0038,01C0,0968,0010,1305   ;2905           Q_RC[0D],CLK.UBCC               ; MORE ADDRESSES TO CHECK?
U 1305, 0000,013C,0180,0800,0000,112A   ;2906           Z?
U 112A, 0000,003C,0180,0800,0000,12FF   ;2907   =0      J/LOOPP                         ; YES
U 112B, 0810,0038,0180,0970,0010,1306   ;2908           D_RC[0E],CLK.UBCC               ; IS BIT 31 SET IN ADR OF ONE'S?
U 1306, 0000,1B3C,0180,0800,0000,1027   ;2909           ALU.N?
U 1027, 0000,003C,0180,0800,0000,1307   ;2910   =0111   J/NEXTADR1
U 102F, 0000,003C,0180,0800,0000,112E   ;2911           J/T005S2                        ; END SUBTEST
                                        ;2912   NEXTADR1:
U 1307, 0501,003C,0180,0A80,0000,1308   ;2913           R[0]_D,D_D.LEFT                 ; SET ADR TO WRITE ZERO'S
U 1308, 0811,0034,0180,0900,0010,1309   ;2914           D_D[AND]RC[0],CLK.UBCC          ; TIME FOR BIT31?
U 1309, 0000,013C,0180,0800,0000,112C   ;2915           Z?
U 112C, 0000,003C,0180,0800,0000,130A   ;2916   =0      J/NOBIT31A
U 112D, 0803,001C,0180,0800,0000,130A   ;2917           D_NOT.MASK
                                        ;2918   NOBIT31A:
U 130A, 0001,003C,0180,09F0,0000,1125   ;2919           RC[0E]_D,J/LOOP0                ; SET NEW ADR TO WRITE ONE'S
                                        ;2920   ;///////////////////////////////////////////////////////////////////////
                                        ;2921   ;+
                                         ;2922    ; NOW CHECK GROUP 1
                                         ;2923    ;-
                                         ;2924    =0
U 112E, 0000,003D,0180,0800,0000,118E    ;2925    T005S2: SUBTEST
U 112F, 0818,0038,0980,0800,0000,130B    ;2926            D_K[.2]                         ; GENERATE INITIAL ADDRESS
U 130B, 0000,003C,01F8,0800,0084,730C    ;2927            SC_K[.8],Q_0                    ; TO WRITE A PTE OF ALL ONE'S
U 130C, 0D00,003C,0180,0800,0000,130D    ;2928            D_DAL.SC
U 130D, 0001,003C,1180,09F0,0084,730E    ;2929            RC[0E]_D,SC_K[.4]               ; EQUALS 200
U 130E, 0003,003C,0580,0A80,0084,930F    ;2930            R[0]_0,SC_SC+K[.1]              ; SET ADDRESS TO WRITE A PTE OF ZERO'S
U 130F, 0818,0038,B980,0800,0000,1310    ;2931            D_K[.19]                        ; GENERATE DATA FOR TBERO TO FORCE
U 1310, 0000,003C,65F8,0800,0084,7311    ;2932            SC_K[.10],Q_0                   ; AND THE WRITE BOTH BIT
U 1311, 0D00,003C,0180,0800,0000,1312    ;2933            D_DAL.SC
U 1312, 0819,0030,0580,0800,0000,1313    ;2934            D_D.OR.K[.1]
U 1313, 0000,003C,4980,3C00,0000,1314    ;2935            ID[TBERO]_D                     ; LOAD THE REGISTER
U 1314, 0003,003C,0180,09E0,0000,1130    ;2936            RC[0C]_0                        ; SET THE EXPECTED PTE
U 1130, 0000,003D,0180,0800,0000,1189    ;2937    =0      ERLOOP
U 1131, 0000,003C,0180,0A00,0200,1315    ;2938    LOOPQ:  VA_ALU,ALU_R[0]                 ; LOAD ADR TO WRITE ZERO'S
U 1315, 0000,003C,8D80,0800,0084,7316    ;2939            SC_K[.1F]
U 1316, 0803,001C,0180,0800,0000,1317    ;2940            D_NOT.MASK                      ; GET PTE
U 1317, 0000,003C,4180,3C00,0000,1318    ;2941            ID[TBUF]_D                      ; LOAD THE PTE
U 1318, 0010,0038,0180,0970,0200,1319    ;2942            VA_ALU,ALU_RC[0E]               ; LOAD ADDRESS TO WRITE ALL ONE'S
U 1319, 0800,003C,0180,0A08,0000,131A    ;2943            D_R[1]                          ; GET THE PTE
U 131A, 0010,0038,41C0,3D70,0000,131B    ;2944            Q_RC[0E],ID[TBUF]_D             ; LOAD THE PTE
U 131B, 0011,2034,01C0,0900,0010,131C    ;2945            Q_Q.AND.RC[0],CLK.UBCC          ; IS BIT 31 SET?
U 131C, 0000,013C,0180,0800,0000,1132    ;2946            Z?
U 1132, 0000,003C,0180,0800,0000,131E    ;2947    =0      J/LOOPR                         ; BRANCH IF NO
U 1133, 0000,003C,8980,0800,0084,731D    ;2948            SC_K[.D]                        ; ADDRESS OF ZERO'S IS 2000
U 131D, 0003,001C,8DC0,0800,0084,731F    ;2949            Q_NOT.MASK,SC_K[.1F],J/NOSHIFT2 ;
U 131E, 0000,003C,01B0,0800,0000,131F    ;2950    LOOPR:  Q_Q.RIGHT
                                         ;2951    NOSHIFT2:
U 131F, 0011,2034,01C0,0900,0200,1320    ;2952            Q_Q.AND.RC[0],VA_ALU            ; LOAD ADR OF PTE OF ZERO'S
U 1320, 0001,203C,0180,09E8,0000,1321    ;2953            RC[0D]_Q                        ; SAVE IT
U 1321, 0000,003C,69F0,2C00,0000,1322    ;2954            Q_ID[TIME.ADDR]                 ; READ THE PTE
U 1322, 0001,203C,0180,0800,0010,1323    ;2955            ALU_Q,CLK.UBCC                  ; IS IT ZERO?
U 1323, 0000,013C,0180,0800,0000,1134    ;2956            Z?
U 1134, 0001,203D,0180,09D8,0000,118C    ;2957    =0      ERROR2,RC[0B]_Q                 ; PTE IS INCORRECT
U 1135, 0010,0038,01C0,0968,0010,1324    ;2958            Q_RC[0D],CLK.UBCC               ; MORE ADDRESSES TO CHECK?
U 1324, 0000,013C,0180,0800,0000,1136    ;2959            Z?
U 1136, 0000,003C,0180,0800,0000,131E    ;2960    =0      J/LOOPR                         ; YES
U 1137, 0810,0038,0180,0970,0010,1325    ;2961            D_RC[0E],CLK.UBCC               ; IS BIT 31 SET IN ADR OF ONE'S?
U 1325, 0000,1B3C,0180,0800,0000,1037    ;2962            ALU.N?
U 1037, 0000,003C,0180,0800,0000,1326    ;2963    =0111   J/NEXTADR2
U 103F, 0000,003C,0180,0800,0000,132A    ;2964            J/ENDT005                       ; END TEST
                                         ;2965    NEXTADR2:
U 1326, 0501,003C,0180,0A80,0000,1327    ;2966            R[0]_D,D_D.LEFT                 ; SET ADR TO WRITE ZERO'S
U 1327, 0811,0034,0180,0900,0010,1328    ;2967            D_D[AND]RC[0],CLK.UBCC          ; TIME FOR BIT31?
U 1328, 0000,013C,0180,0800,0000,1138    ;2968            Z?
U 1138, 0000,003C,0180,0800,0000,1329    ;2969    =0      J/NOBIT31B
U 1139, 0803,001C,0180,0800,0000,1329    ;2970            D_NOT.MASK
                                         ;2971    NOBIT31B:
U 1329, 0001,003C,0180,09F0,0000,1131    ;2972            RC[0E]_D,J/LOOPQ                ; SET NEW ADR TO WRITE ONE'S
U 132A, 0000,003C,0180,0800,0000,113A    ;2973    ENDT005:NOP
```

```
                                        ;2974          .PAGE   "TEST BA       DYNAMIC MEMORY TEST OF TB ADDRESS MEMORY"
                                        ;2975   ;*******************************************************************
                                        ;2976   ;++
                                        ;2977   ;
                                        ;2978   ; TEST  BA      DYNAMIC MEMORY TEST OF TB ADDRESS MEMORY
                                        ;2979   ;
                                        ;2980   ; TEST DESCRIPTION
                                        ;2981   ;
                                        ;2982   ;       THIS TEST PERFORMS A MOVING INVERSIONS TEST OF THE TB ADDRESS
                                        ;2983   ;       MEMORY. MEMORY FAILURES ARE DETECTED BY A PARITY ERROR.
                                        ;2984   ;
                                        ;2985   ; LOGIC DESCRIPTION
                                        ;2986   ;
                                        ;2987   ;       THIS TEST CHECKS THE MEMORY CHIPS OF THE TB ADDRESS MEMORY ON THE
                                        ;2988   ;       CAM MODULE.
                                        ;2989   ;
                                        ;2990   ; ERROR DESCRIPTION
                                        ;2991   ;
                                        ;2992   ;       DATA: ADDRESS THAT HAD A PARITY ERROR
                                        ;2993   ;             BACKWARD SEQUENCE FLAG (0 = FOREWARD & 1 = BACKWARD SEQUENCE)
                                        ;2994   ;             ADDRESS INCREMENT/DECREMENT VALUE
                                        ;2995   ;             CONTENTS OF TBER1
                                        ;2996   ;
                                        ;2997   ;       BY ANALYZING THE CONTENTS OF TBER1 (THE PARITY ERROR BITS) IT
                                        ;2998   ;       SHOULD BE POSSIBLE TO DETERMINE WHICH CHIP FAILED.
                                        ;2999   ;--
                                        ;3000   ;*********************************************************************
                                        ;3001   =0
U 113A, 0018,0039,1180,09F8,0000,105B   ;3002   T006:   NEWTST[.4]
                                        ;3003   ;+
                                        ;3004   ; INITIALIZE SOME FLAGS AND REGISTERS
                                        ;3005   ;-
U 113B, 0000,003C,D980,0800,0084,732B   ;3006           SC_K[.9]
U 132B, 0818,0038,8DF8,0800,0000,132C   ;3007           D_K[.1F],Q_0                    ; GENERATE THE MASK FOR TAG BITS
U 132C, 0D00,003C,8D80,0800,0084,732D   ;3008           D_DAL.SC,SC_K[.1F]              ; <31,13:9>
U 132D, 0001,001C,0180,0980,0000,132E   ;3009           RC[0]_D.ORNOT.MASK              ; SAVE IN RC[0] = 80003E00
U 132E, 0018,0038,0580,09E0,0000,132F   ;3010           RC[0C]_K[.1]                    ; SET THE INCREMENT/DEC VALUE
U 132F, 0000,003C,2180,0800,0084,7330   ;3011           SC_K[.14]
U 1330, 0803,001C,0180,0800,0000,1331   ;3012           D_NOT.MASK                      ; GENERATE DATA FOR THE TBER0
U 1331, 0819,0030,0580,0800,0000,1332   ;3013           D_D.OR.K[.1]                    ; REGISTER (WRITE BOTH & MME)
U 1332, 0000,003C,4980,3C00,0000,113C   ;3014           ID[TBER0]_D                     ; TURN ON THE TB
U 113C, 0000,003D,0180,0800,0000,1202   ;3015   =0      CALL[FILLZERO]                  ; FILL THE TAG MEMORY WITH ZERO'S
U 113D, 0003,003C,0180,09E8,0000,1333   ;3016   NEXTLSB:RC[0D]_0                        ; SET THE FOREWARD SEQ FLAG
U 1333, 0003,003C,0180,0A90,0000,1334   ;3017           R[2]_0                          ; SET DATA FLAG TO ZERO
U 1334, 0818,0038,45C0,0800,0000,1335   ;3018           D_K[.8000],Q_ALU                ; GENERATE THE ADDRESS THAT
U 1335, 0B03,003C,0180,0AA0,0000,1336   ;3019           D_D.SWAP,R[4]_0                 ; WRITES ONE'S
U 1336, 001D,0030,0180,0A98,0000,1337   ;3020           R[3]_D.OR.Q                     ; EQUALS 00808000 (2 CHIPS)
                                        ;3021   ;+
                                        ;3022   ; NOW START THE FOREWARD SEQUENCE
                                        ;3023   ;   READ THE LOCATION
                                        ;3024   ;   WRITE THE COMPLIMENT BIT
                                        ;3025   ;   READ THE LOCATION
                                        ;3026   ;-
U 1337, 0018,0038,0180,0998,0000,1338   ;3027           RC[3]_K[.8]                     ; SET THE LOOP COUNT FOR THE NUMBER
                                        ;3028                                           ; OF BITS PER CHIP
```

```
                                          LOOPBITS:
U 1338, 0018,0038,3180,0990,0000,1339                     RC[02]_K[.40]                      ; SET THE LOOP COUNT FOR THE NUMBER
                                                                                             ; OF ADDRESSES PER CHIP
                                          LOOPADDRESS:
U 1339, 0000,003C,5D80,0800,0084,733A                     SC_K[.7]                           ; SET THE PARITY ERROR MICRO
U 133A, 0003,001C,8D80,0AF8,0084,733B                     R[OF]_NOT.MASK,SC_K[.1F]           ; TRAP FLAG
U 133B, 0800,003C,0180,0A18,0200,133C                     VA_ALU,ALU_R[3],D_ALU              ; READ THE LOCATION OF ZERO'S
U 133C, 0000,003C,0180,0000,0000,133D                     MCT/TEST.RCHK                      ; PARITY ERROR?
U 133D, 0000,003C,0180,0A78,0010,133F                     ALU_R[OF],CLK.UBCC                 ; SHOULD BE NON ZERO
U 133E, 0000,013C,4DF0,2C00,0000,113E                     Z?,Q_ID[TBER1]                     ; BRANCH IF TRAP OCCURRED
U 113E, 0000,003C,0180,0800,0000,133F     =0              J/READOK
U 113F, 0001,203C,5D80,09D8,0084,7140                     SC_K[.7],RC[0B]_Q
U 1140, 0001,003D,0180,09F0,0000,118C     =0              ERROR2,RC[0E]_D                    ; PARITY ERROR ON READ
U 1141, 0003,001C,8D80,0AF8,0084,733F                     R[OF]_NOT.MASK,SC_K[.1F]
                                          ;+
                                          ; THE READ WAS OK, NOW WRITE THE COMPLIMENT BIT
                                          ;-
                                          READOK:
U 133F, 0000,003C,01C0,0A18,0200,1340                     VA_ALU,ALU_R[3],Q_ALU              ; LOAD THE ADDRESS OF ONE'S
U 1340, 0803,001C,0180,0800,0000,1341                     D_NOT.MASK                         ; MAKE IT A VALID PTE
U 1341, 0000,003C,4180,3C00,0000,1342                     ID[TBUF]_D                         ; WRITE THE MEMORY
U 1342, 0C00,003C,0180,0000,0000,1343                     MCT/TEST.RCHK,D_Q                  ; READ AND CHECK FOR PARITY ERROR
U 1343, 0000,003C,0180,0A78,0010,1344                     ALU_R[OF],CLK.UBCC                 ; SHOULD BE NON-ZERO
U 1344, 0000,013C,4DF0,2C00,0000,1142                     Z?,Q_ID[TBER1]
U 1142, 0000,003C,0180,0800,0000,1345     =0              J/READCOMPOK                       ; READ OF COMPLIMENT PATTERN OK
U 1143, 0001,203C,5D80,09D8,0084,7144                     SC_K[.7],RC[0B]_Q
U 1144, 0001,003D,0180,09F0,0000,118C     =0              ERROR2,RC[0E]_D                    ; PARITY ERROR OF READ ON COMPLIMENT
                                                                                             ; PATTERN
U 1145, 0003,001C,8D80,0AF8,0084,7345                     R[OF]_NOT.MASK,SC_K[.1F]
                                          ;+
                                          ; NOW CHECK IF THE FOREWARD SEQUENCE IS DONE
                                          ;-
                                          READCOMPOK:
U 1345, 0810,0038,0180,0910,0000,1346                     D_RC[2]                            ; GET THE ADDRESS LOOP COUNT
U 1346, 0019,0000,0580,0990,0010,1347                     RC[2]_D-K[.1],CLK.UBCC
U 1347, 0000,013C,0180,0800,0000,1146                     Z?
U 1146, 0000,003C,0180,0800,0000,1152     =0              J/INCADR                           ; NOT DONE, GO INCRMENT THE TAG
U 1147, 0810,0038,0180,0918,0000,1348                     D_RC[3]                            ; DONE ALL THE BITS YET?
U 1348, 0019,0000,0580,0998,0010,1349                     RC[3]_D-K[.1],CLK.UBCC             ; BRANCH IF YES
U 1349, 0000,013C,0180,0800,0000,1148                     Z?
U 1148, 0000,003C,0180,0800,0000,1156     =0              J/BITSHIFT                         ; GO SELECT NEXT BIT
U 1149, 0000,003C,0180,0A10,0010,134A                     ALU_R[2],CLK.UBCC                  ; DATA = 1?
U 134A, 0018,0138,0580,0A90,0000,114A                     Z?,R[2]_K[.1]                      ; BRANCH IF NO
U 114A, 0000,003C,0180,0800,0000,1358     =0              J/BACKWARD                         ; SET BACKWARD SEQUENCE
U 114B, 0818,0038,5980,0800,0000,134B                     D_K[.7F]                           ; SET THE ADDRESS TO ZERO
U 134B, 0000,003C,01F8,0800,0084,734C                     SC_K[.8],Q_0                       ; AND THE DATA BITS TO ONE'S
U 134C, 0D00,003C,0180,0800,0000,134D                     D_DAL.SC                           ; EXCEPT FOR BIT 0 (2 CHIPS)
U 134D, 0819,0030,5980,0800,0000,134E                     D_D.OR.K[.7F]                      ; ...
U 134E, 0B18,0038,0180,0998,0000,134F                     D_D.SWAP,RC[3]_K[.8]               ; SET THE BIT COUNT
U 134F, 0010,0038,0180,0968,0010,1350                     ALU_RC[0D],CLK.UBCC                ; FOREWARD SEQ?
U 1350, 0003,013C,0180,0AA0,0000,114C                     Z?,R[4]_0                          ; BRANCH IF YES
U 114C, 0000,003C,0180,0800,0000,1351     =0              J/SETMAXADDRESS
U 114D, 0001,003C,8D80,0A98,0084,7338                     R[3]_D,SC_K[.1F],J/LOOPBITS        ; CONTINUE FOREWARD SEQUENCE
                                          SETMAXADDRESS:
U 1351, 0001,003C,D980,0A88,0084,7352                     R[1]_D,SC_K[.9]                    ; SAVE D
```

```
U 1352, 0818,0038,8DF8,0800,0000,1353   ;3084           D_K[.1F],Q_0
U 1353, 0D00,003C,8D80,0800,0084,7354   ;3085           D_DAL.SC,SC_K[.1F]
U 1354, 0801,001C,0180,0800,0000,1355   ;3086           D_D.ORNOT.MASK
U 1355, 081C,2030,0180,0A08,0000,1356   ;3087           D_R[1].OR.D                 ;ADDRESS AND INITIAL DATA PATTERN
U 1356, 0018,0038,5580,0AA0,0000,1357   ;3088           R[4]_K[.3F]
U 1357, 0001,003C,0180,0A98,0000,1338   ;3089           R[3]_D,J/LOOPBITS
                                        ;3090   BACKWARD:
U 1358, 0010,0038,0180,0968,0010,1359   ;3091           ALU_RC[0D],CLK.UBCC             ; AM I DOING BACKWARD SEQ?
U 1359, 0018,0138,0580,09E8,0000,114E   ;3092           Z?,RC[0D]_K[.1]                 ; BRANCH IF NO
U 114E, 0000,003C,0180,0800,0000,1363   ;3093   =0      J/INCLSB                        ; SELECT NEXT ADDRESS LSB
U 114F, 0003,003C,0180,0A90,0000,135A   ;3094           R[2]_0                          ; SET THE DATA FLAG TO ZERO
U 135A, 0018,0038,0180,0998,0000,135B   ;3095           RC[3]_K[.8]                     ; SET THE BIT LOOP COUNT
U 135B, 0018,0038,5580,0AA0,0000,135C   ;3096           R[4]_K[.3F]                     ; SET THE CONCATENATED ADDRESS
U 135C, 0818,0038,8D80,0800,0000,135D   ;3097           D_K[.1F]                        ; INIT ADDRESS AND DATA BITS
U 135D, 0000,003C,D9F8,0800,0084,735E   ;3098           SC_K[.9],Q_0                    ; FOR THE BACKWARD SEQUENCE
U 135E, 0D00,003C,8D80,0800,0084,735F   ;3099           D_DAL.SC,SC_K[.1F]
U 135F, 0801,001C,6180,0800,0084,7360   ;3100           D_D.ORNOT.MASK,SC_K[.F]
U 1360, 0801,001C,7D80,0800,0084,7361   ;3101           D_D.ORNOT.MASK,SC_K[.18]
U 1361, 0000,003C,0580,0800,0084,B362   ;3102           SC_SC-K[.1]                     ; ALSO INSERT BIT 23
U 1362, 0001,001C,8D80,0A98,0084,7338   ;3103           R[3]_D.ORNOT.MASK,SC_K[.1F],J/LOOPBITS ; START BACKWARD SEQUENCE
U 1363, 0810,0038,D580,0960,0084,7364   ;3104   INCLSB: D_RC[0C],SC_K[.6]               ; GET ENCREMENT VALUE
U 1364, 0500,003C,0180,0800,0000,1365   ;3105           D_D.LEFT                        ; SELECT NEXT VALUE
U 1365, 0001,0034,0180,09E0,0010,1366   ;3106           RC[0C]_D.AND.MASK,CLK.UBCC      ; DONE YET?
U 1366, 0000,013C,0180,0800,0000,1150   ;3107           Z?
U 1150, 0000,003C,8D80,0800,0084,713D   ;3108   =0      SC_K[.1F],J/NEXTLSB             ; NO
U 1151, 0000,003C,0180,0800,0000,1370   ;3109           J/ENDT006                       ; DONE
                                        ;3110   =0
U 1152, 0000,003D,0180,0800,0000,1212   ;3111   INCADR: CALL[INCDECADDRESS]
U 1153, 0000,003C,8D80,0800,0084,7339   ;3112           SC_K[.1F],J/LOOPADDRESS
                                        ;3113   =0
                                        ;3114   BITSHIFT:
U 1156, 0000,003D,0180,0800,0000,1225   ;3115           CALL[SETNEWDATABIT]
U 1157, 0800,003C,0180,0A18,0000,1367   ;3116           D_R[3]                          ; GET THE ADDRESS
U 1367, 0811,0024,0180,0900,0000,1368   ;3117           D_D.ANDNOT.RC[0]                ; SAVE DATA BITS
U 1368, 0001,003C,0180,0A98,0000,1369   ;3118           R[3]_D
U 1369, 0010,0038,0180,0968,0010,136A   ;3119           ALU_RC[0D],CLK.UBCC             ; FOREWARD SEQUENCE?
U 136A, 0000,013C,D980,0800,0084,7158   ;3120           Z?,SC_K[.9]
U 1158, 0000,003C,0180,0800,0000,136B   ;3121   =0      J/BAKBITSHIFT                   ; NO
U 1159, 0000,003C,8D80,0800,0084,7338   ;3122           SC_K[.1F],J/LOOPBITS            ; ADDRESS SET AT ZERO, CONTINUE
                                        ;3123   BAKBITSHIFT:
U 136B, 0818,0038,8DF8,0800,0000,136C   ;3124           D_K[.1F],Q_0                    ; SET THE MAX ADDRESS
U 136C, 0D00,003C,8D80,0800,0084,736D   ;3125           D_DAL.SC,SC_K[.1F]
U 136D, 0801,001C,0180,0800,0000,136E   ;3126           D_D.ORNOT.MASK
U 136E, 081C,2030,0180,0A18,0000,136F   ;3127           D_R[3].OR.D                     ; INSERT DATA BITS
U 136F, 0001,003C,8D80,0A98,0084,7338   ;3128           R[3]_D,SC_K[.1F],J/LOOPBITS     ; MAX ADDRESS, CONTINUE
U 1370, 0000,003C,0180,0800,0000,115A   ;3129   ENDT006:NOP
```

```
                                          ;3130           .PAGE   "TEST BB        DYNAMIC MEMORY TEST OF TB DATA MEMORY (PTE'S)"
                                          ;3131   ;*********************************************************************
                                          ;3132   ;++
                                          ;3133   ; TEST  BB      DYNAMIC MEMORY TEST OF TB DATA MEMORY (PTE'S)
                                          ;3134   ;
                                          ;3135   ; TEST DESCRIPTION
                                          ;3136   ;
                                          ;3137   ;       THIS TEST PERFORMS A MOVING INVERSIONS TEST OF THE TB DATA MEMORY.
                                          ;3138   ;       MEMORY FAILURES ARE DETECTED BY A PARITY ERROR.
                                          ;3139   ;
                                          ;3140   ; LOGIC DESCRIPTION
                                          ;3141   ;
                                          ;3142   ;       THIS TEST CHECKS THE MEMORY CHIPS OF THE TB DATA MEMORY ON THE
                                          ;3143   ;       TBM MODULE AND THE CAM MODULE.
                                          ;3144   ;
                                          ;3145   ; DATA DESCRIPTION
                                          ;3146   ;
                                          ;3147   ;       DATA: ADDRESS THAT HAD A PARITY ERROR
                                          ;3148   ;             BACKWARD SEQUENCE FLAG (0 = FOREWARD & 1 = BACKWARD SEQUENCE)
                                          ;3149   ;             ADDRESS INCREMENT/DECREMENT VALUE
                                          ;3150   ;             CONTENTS OF TBER1
                                          ;3151   ;++
                                          ;3152   ;*********************************************************************
                                          ;3153   =0
U 115A, 0018,0039,1180,09F8,0000,105B     ;3154   T007:   NEWTST[.4]
                                          ;3155   ;+
                                          ;3156   ; INITIALIZE SOME FLAGS AND REGISTERS
                                          ;3157   ;-
U 115B, 0000,003C,D980,0800,0084,7371     ;3158           SC_K[.9]                        ; CENERATE THE MASK FOR TAG
U 1371, 0818,0038,8DF8,0800,0000,1372     ;3159           D_K[.1F],Q_0                    ; BITS <31,13:9>
U 1372, 0D00,003C,8D80,0800,0084,7373     ;3160           D_DAL.SC,SC_K[.1F]
U 1373, 0001,001C,0180,0980,0000,1374     ;3161           RC[0]_D.ORNOT.MASK              ; SAVE = 80003E00
U 1374, 0018,0038,0580,09E0,0000,1375     ;3162           RC[0C]_K[.1]                    ; SET THE INCREMENT/DEC VALUE
U 1375, 0000,003C,2180,0800,0084,7376     ;3163           SC_K[.14]                       ; GENERATE DATA FOR TBER0
U 1376, 0803,001C,0180,0800,0000,1377     ;3164           D_NOT.MASK
U 1377, 0819,0030,0580,0800,0000,1378     ;3165           D_D.OR.K[.1]
U 1378, 0000,003C,4980,3C00,0000,115C     ;3166           ID[TBER0]_D                     ; TURN ON THE TB
U 115C, 0000,003D,0180,0800,0000,1202     ;3167   =0      CALL[FILLZERO]                  ; FILL THE PTE'S WITH ZERO
U 115D, 0000,003C,8980,0800,0084,7379     ;3168           SC_K[.D]
U 1379, 0818,0038,91F8,0800,0000,137A     ;3169           D_K[.1F00],Q_0                  ; GENERATE A MASK FOR THE
U 137A, 0D00,003C,0180,0800,0000,137B     ;3170           D_DAL.SC                        ; MUST BE ZERO MASK
U 137B, 0001,003C,0180,0AA8,0000,137C     ;3171           R[5]_D                          ; EQUALS 03E00000
U 137C, 0818,0038,4180,0800,0000,137D     ;3172           D_K[.80]
U 137D, 0500,003C,0180,0800,0000,137E     ;3173           D_D.LEFT                        ; GENERATE THE INITIAL DATA
U 137E, 0819,0030,05C0,0800,0000,137F     ;3174           D_D.OR.K[.1],Q_ALU              ; PATTERN FOR THE PTE
U 137F, 0B00,003C,0180,0800,0000,1380     ;3175           D_D.SWAP
U 1380, 081D,0030,0180,0AB0,0000,1381     ;3176           R[6]_D.OR.Q,D_ALU               ; EQUALS 01010101
U 1381, 0001,003C,0180,0AC0,0000,1382     ;3177           R[8]_D                          ; SAVE FOR BIT SHIFT
                                          ;3178   PTENEXTLSB:
U 1382, 0003,003C,0180,09E8,0000,1383     ;3179           RC[0D]_0                        ; SET THE FOREWARD SEQ FLAG
U 1383, 0003,003C,0180,0A90,0000,1384     ;3180           R[2]_0                          ; SET THE DATA FLAG TO ZERO
U 1384, 0003,003C,0180,0A98,0000,1385     ;3181           R[3]_0                          ; SET THE ADDRESS TO ZERO
U 1385, 0003,003C,0180,0AA0,0000,1386     ;3182           R[4]_0                          ; SET CONCATINATED TAG FILED TO ZERO
U 1386, 0800,003C,0180,0A40,0000,1387     ;3183           D_R[8]                          ; GET INITIAL DATA PATTERN
U 1387, 0001,003C,0180,0AB0,0000,1388     ;3184           R[6]_D                          ; INIT THE PATTERN
```

```
U 1388, 0000,003C,01C0,0A28,0000,1389   ;3185           Q_R[5]                          ; GET MBZ MASK
U 1389, 001D,0024,0180,0AB8,0000,138A   ;3186           R[7]_D.ANDNOT.Q                 ; MASK MBZ BITS
                                        ;3187   ;+
                                        ;3188   ; NOW START THE FOREWARD SEQUENCE
                                        ;3189   ;    READ THE LOCATION
                                        ;3190   ;    WRITE THE COMPLIMENT BIT
                                        ;3191   ;    READ THE LOCATION
                                        ;3192   ;-
U 138A, 0018,0038,0180,0998,0000,138B   ;3193           RC[3]_K[.8]                     ; SET THE LOOP COUNT FOR THE NUMBER
                                        ;3194                                           ; OF BITS PER CHIP
                                        ;3195   PTELOOPBITS:
U 138B, 0018,0038,3180,0990,0000,138C   ;3196           RC[02]_K[.40]                   ; SET THE LOOP COUNT FOR THE NUMBER
                                        ;3197                                           ; OF ADDRESSES PER CHIP
                                        ;3198   PTELOOPADDRESS:
U 138C, 0000,003C,5D80,0800,0084,738D   ;3199           SC_K[.7]                        ; SET THE PARITY ERROR MICRO
U 138D, 0003,001C,8D80,0AF8,0084,738E   ;3200           R[0F]_NOT.MASK,SC_K[.1F]        ; TRAP FLAG
U 138E, 0800,003C,0180,0A18,0200,138F   ;3201           VA_ALU,ALU_R[3],D_ALU           ; READ THE LOCATION OF ZERO'S
U 138F, 0000,003C,0180,0000,0000,1390   ;3202           MCT/TEST.RCHK                   ; PARITY ERROR?
U 1390, 0000,003C,0180,0A78,0010,1391   ;3203           ALU_R[0F],CLK.UBCC              ; SHOULD BE NON ZERO
U 1391, 0000,013C,4DF0,2C00,0000,115E   ;3204           Z?,Q_ID[TBER1]                  ; BRANCH IF TRAP OCCURRED
U 115E, 0000,003C,0180,0800,0000,1392   ;3205   =0      J/PTEREADOK
U 115F, 0001,203C,5D80,09D8,0084,7160   ;3206           SC_K[.7],RC[0B]_Q
U 1160, 0001,003D,0180,09F0,0000,118C   ;3207   =0      ERROR2,RC[0E]_D                 ; PARITY ERROR ON READ
U 1161, 0003,001C,8D80,0AF8,0084,7392   ;3208           R[0F]_NOT.MASK,SC_K[.1F]
                                        ;3209   ;+
                                        ;3210   ; THE READ WAS OK, NOW WRITE THE COMPLIMENT BIT
                                        ;3211   ;-
                                        ;3212   PTEREADOK:
U 1392, 0000,003C,01C0,0A18,0200,1393   ;3213           VA_ALU,ALU_R[3],Q_ALU           ; LOAD THE ADDRESS OF ONE'S
U 1393, 0800,003C,0180,0A38,0000,1394   ;3214           D_R[7]                          ; GET PTE DATA
U 1394, 0000,003C,4180,3C00,0000,1395   ;3215           ID[TBUF]_D                      ; WRITE THE MEMORY
U 1395, 0C00,003C,0180,0000,0000,1396   ;3216           MCT/TEST.RCHK,D_Q               ; READ AND CHECK FOR PARITY ERROR
U 1396, 0000,003C,0180,0A78,0010,1397   ;3217           ALU_R[0F],CLK.UBCC              ; SHOULD BE NON-ZERO
U 1397, 0000,013C,4DF0,2C00,0000,1162   ;3218           Z?,Q_ID[TBER1]
U 1162, 0000,003C,0180,0800,0000,1398   ;3219   =0      J/PTEREADCOMPOK                 ; READ OF COMPLIMENT PATTERN OK
U 1163, 0001,203C,5D80,09D8,0084,7164   ;3220           SC_K[.7],RC[0B]_Q
U 1164, 0001,003D,0180,09F0,0000,118C   ;3221   =0      ERROR2,RC[0E]_D                 ; PARITY ERROR OF READ ON COMPLIMENT
                                        ;3222                                           ; PATTERN
U 1165, 0003,001C,8D80,0AF8,0084,7398   ;3223           R[0F]_NOT.MASK,SC_K[.1F]
                                        ;3224   ;+
                                        ;3225   ; NOW CHECK IF THE FOREWARD SEQUENCE IS DONE
                                        ;3226   ;-
                                        ;3227   PTEREADCOMPOK:
U 1398, 0810,0038,0180,0910,0000,1399   ;3228           D_RC[2]                         ; GET THE ADDRESS LOOP COUNT
U 1399, 0019,0000,0580,0990,0010,139A   ;3229           RC[2]_D-K[.1],CLK.UBCC
U 139A, 0000,013C,0180,0800,0000,1166   ;3230           Z?
U 1166, 0000,003C,0180,0800,0000,1172   ;3231   =0      J/PTEINCADR                     ; NOT DONE, GO INCRMENT THE TAG
U 1167, 0810,0038,0180,0918,0000,139B   ;3232           D_RC[3]                         ; DONE ALL THE BITS YET?
U 139B, 0019,0000,0580,0998,0010,139C   ;3233           RC[3]_D-K[.1],CLK.UBCC          ; BRANCH IF YES
U 139C, 0000,013C,0180,0800,0000,1168   ;3234           Z?
U 1168, 0000,003C,0180,0800,0000,1174   ;3235   =0      J/PTEBITSHIFT                   ; GO SELECT NEXT BIT
U 1169, 0000,003C,0180,0A10,0010,139D   ;3236           ALU_R[2],CLK.UBCC               ; DATA = 1?
U 139D, 0018,0138,0580,0A90,0000,116A   ;3237           Z?,R[2]_K[.1]                   ; BRANCH IF NO
U 116A, 0000,003C,0180,0800,0000,13AD   ;3238   =0      J/PTEBACKWARD                   ; SET BACKWARD SEQUENCE
U 116B, 0003,003C,0180,0A98,0084,739E   ;3239           R[3]_0,SC_K[.8]                 ; SET THE ADDRESS TO ZERO
```

```
U 139E, 0818,0038,4980,0800,0000,139F   ;3240           D_K[.FF]                        ; SET THE DATA TO ALL ONES
U 139F, 0819,0000,0580,0A88,0000,13A0   ;3241           D_D-K[.1],R[1]_ALU              ; EXCEPT FOR BIT 0 OF EACH CHIP
U 13A0, 0D00,003C,0180,0800,0000,13A1   ;3242           D_DAL.SC
U 13A1, 081C,2030,01C0,0A08,0000,13A2   ;3243           D_D.OR.R[1],Q_ALU
U 13A2, 0B03,003C,0180,0AA0,0000,13A3   ;3244           D_D.SWAP,R[4]_0
U 13A3, 081D,0030,0180,0AB0,0000,13A4   ;3245           D_D.OR.Q,R[6]_ALU               ; EQUALS FEFEFEFE
U 13A4, 0000,003C,01C0,0A28,0000,13A5   ;3246           Q_R[5]
U 13A5, 081D,0024,0180,0AB8,0000,13A6   ;3247           D_D.ANDNOT.Q,R[7]_ALU           ; ZERO MBZ BITS
U 13A6, 0010,0038,0180,0968,0010,13A7   ;3248           ALU_RC[0D],CLK.UBCC             ; BACKWARD SEQ?
U 13A7, 0018,0138,0180,0998,0000,116C   ;3249           Z?,RC[3]_K[.8]                  ; BRANCH IF NO
U 116C, 0000,003C,0180,0800,0000,13A8   ;3250   =0      J/PTESETMAXADR
U 116D, 0000,003C,8D80,0800,0084,738B   ;3251           SC_K[.1F],J/PTELOOPBITS
                                        ;3252   PTESETMAXADR:
U 13A8, 0818,0038,8D80,0800,0000,13A9   ;3253           D_K[.1F]                        ; SET THE MAX ADDRESS
U 13A9, 0000,003C,D9F8,0800,0084,73AA   ;3254           SC_K[.9],Q_0
U 13AA, 0D00,003C,8D80,0800,0084,73AB   ;3255           D_DAL.SC,SC_K[.1F]
U 13AB, 0018,0038,5580,0AA0,0000,13AC   ;3256           R[4]_K[.3F]                     ; SET THE CONCAT. ADDRESS
U 13AC, 0001,001C,0180,0A98,0000,138B   ;3257           R[3]_D.ORNOT.MASK,J/PTELOOPBITS
                                        ;3258   PTEBACKWARD:
U 13AD, 0010,0038,0180,0968,0010,13AE   ;3259           ALU_RC[0D],CLK.UBCC             ; AM I DOING BACKWARD SEQ?
U 13AE, 0018,0138,0580,09E8,0000,116E   ;3260           Z?,RC[0D]_K[.1]                 ; BRANCH IF NO
U 116E, 0000,003C,0180,0800,0000,13B8   ;3261   =0      J/PTEINCLSB                     ; SELECT NEXT ADDRESS LSB
U 116F, 0800,003C,0180,0A40,0000,13AF   ;3262           D_R[8]                          ; GET INITIAL DATA PATTERN
U 13AF, 0000,003C,01C0,0A28,0000,13B0   ;3263           Q_R[5]
U 13B0, 081D,0024,0180,0AB8,0000,13B1   ;3264           D_D.ANDNOT.Q,R[7]_ALU           ; MASK MBZ BITS
U 13B1, 0003,003C,0180,0A90,0000,13B2   ;3265           R[2]_0                          ; SET THE DATA FLAG TO ZERO
U 13B2, 0018,0038,0180,0998,0000,13B3   ;3266           RC[3]_K[.8]                     ; SET THE BIT LOOP COUNT
U 13B3, 0018,0038,5580,0AA0,0000,13B4   ;3267           R[4]_K[.3F]                     ; SET THE CONCATENATED ADDRESS
U 13B4, 0818,0038,8D80,0800,0000,13B5   ;3268           D_K[.1F]                        ; INIT ADDRESS AND DATA BITS
U 13B5, 0000,003C,D9F8,0800,0084,73B6   ;3269           SC_K[.9],Q_0                    ; FOR THE BACKWARD SEQUENCE
U 13B6, 0D00,003C,8D80,0800,0084,73B7   ;3270           D_DAL.SC,SC_K[.1F]
U 13B7, 0801,001C,8D80,0A98,0084,738B   ;3271           R[3]_ALU,D_D.ORNOT.MASK,SC_K[.1F],J/PTELOOPBITS
U 13B8, 0810,0038,D580,0960,0084,73B9   ;3272   PTEINCLSB:D_RC[0C],SC_K[.6]             ; GET ENCREMENT VALUE
U 13B9, 0500,003C,0180,0800,0000,13BA   ;3273           D_D.LEFT                        ; SELECT NEXT VALUE
U 13BA, 0001,0034,0180,09E0,0010,13BB   ;3274           RC[0C]_D.AND.MASK,CLK.UBCC      ; DONE YET?
U 13BB, 0000,013C,0180,0800,0000,1170   ;3275           Z?
U 1170, 0000,003C,8D80,0800,0084,7382   ;3276   =0      SC_K[.1F],J/PTENEXTLSB          ; NO
U 1171, 0000,003C,0180,0800,0000,13C2   ;3277           J/ENDT007                       ; DONE
                                        ;3278   =0
U 1172, 0000,003D,0180,0800,0000,1212   ;3279   PTEINCADR:CALL[INCDECADDRESS]
U 1173, 0000,003C,8D80,0800,0084,738C   ;3280           SC_K[.1F],J/PTELOOPADDRESS
                                        ;3281   =0
                                        ;3282   PTEBITSHIFT:
U 1174, 0000,003D,0180,0800,0000,1232   ;3283           CALL[PTESETNEWDATABIT]
U 1175, 0003,003C,0180,0A98,0000,13BC   ;3284           R[3]_0                          ; SET THE BASE ADDRESS FOR FOR SEQ
U 13BC, 0010,0038,0180,0968,0010,13BD   ;3285           ALU_RC[0D],CLK.UBCC             ; FOREWARD SEQ?
U 13BD, 0000,013C,D980,0800,0084,7176   ;3286           Z?,SC_K[.9]
U 1176, 0000,003C,0180,0800,0000,13BE   ;3287   =0      J/PTEBAKBITSHIFT                ; NO
U 1177, 0000,003C,8D80,0800,0084,738B   ;3288           SC_K[.1F],J/PTELOOPBITS
                                        ;3289   PTEBAKBITSHIFT:
U 13BE, 0818,0038,8DF8,0800,0000,13BF   ;3290           D_K[.1F],Q_0                    ; SET THE MAXIMUM ADDRESS
U 13BF, 0D00,003C,8D80,0800,0084,73C0   ;3291           D_DAL.SC,SC_K[.1F]
U 13C0, 0001,001C,8D80,0A98,0084,738B   ;3292           R[3]_D.ORNOT.MASK,SC_K[.1F],J/PTELOOPBITS ; SET MAX ADDRESS
U 13C1, 0000,003C,8D80,0800,0084,738B   ;3293           SC_K[.1F],J/PTELOOPBITS
U 13C2, 0000,003C,0180,0800,0000,13C3   ;3294   ENDT007:NOP
```

```
U 13C3, 0000,003D,0180,0800,0000,105B   ;3295   ENDTST: NEWTST
```

```
;                               Location / Line Number Index

;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000           1867:    1838     1841=    1857=    1858=    1859=    1839     2264=
U 1008           1945=    1946=    1963=    1964=    1973=    1974=    1840     2265=
U 1010           1975=    1976=    1977=    1978=    1983=    1984=    1860     2799=
U 1018           1987=    1988=    1997=    1998=    1999=    2000=    1861     2800=
U 1020           2016=    2017=    2018=    2019=    2028=    2029=    1862     2910=
U 1028           2044=    2045=    2049=    2050=    2066=    2067=    1863     2911=
U 1030           2069=    2070=    2074=    2075=    2102=    2103=    1864     2963=
U 1038           2105=    2106=    2108=    2109=    2112=    2113=    1865     2964=
U 1040           2393=    2394=    2395=    2396=    2397=    2398=    2399=    2400=
U 1048           2115=    2116=    2118=    2119=    2122=    2123=    1896:    1866
U 1050           2462=    2463=    2464=    2465=    2466=    2467=    2468=    2469=
U 1058           2126=    2127=    1899:    1876     2164=    2165=    1902:    1877
U 1060           2542=    2543=    2544=    2545=    2546=    2547=    2548=    2549=
U 1068           2620=    2621=    2622=    2623=    2624=    2625=    2626=    2627=
U 1070           2698=    2699=    2700=    2701=    2702=    2703=    2704=    2705=
U 1078           2168=    2169=    2171=    2172=    2173=    2174=    2177=    2178=
U 1080           2180=    2181=    2182=    2183=    2186=    2187=    2189=    2190=
U 1088           2191=    2192=    2195=    2196=    2198=    2199=    2231=    2232=
U 1090           2235=    2236=    2252=    2253=    2256=    2257=    2289=    2290=
U 1098           2303=    2304=    2335=    2336=    2337=    2338=    2339=    2340=
U 10A0           2341=    2342=    2344=    2345=    2351=    2352=    2354=    2355=
U 10A8           2366=    2367=    2372=    2373=    2375=    2376=    2387=    2389=
U 10B0           2402=    2403=    2431=    2432=    2433=    2434=    2435=    2436=
U 10B8           2437=    2438=    2443=    2444=    2448=    2449=    2456=    2457=
U 10C0           2460=    2461=    2471=    2472=    2479=    2480=    2482=    2483=
U 10C8           2511=    2512=    2513=    2514=    2515=    2516=    2517=    2518=
U 10D0           2523=    2524=    2528=    2529=    2536=    2537=    2540=    2541=
U 10D8           2551=    2552=    2559=    2560=    2562=    2563=    2590=    2591=
U 10E0           2592=    2593=    2594=    2595=    2596=    2597=    2604=    2605=
U 10E8           2609=    2610=    2618=    2619=    2629=    2630=    2637=    2638=
U 10F0           2640=    2641=    2668=    2669=    2670=    2671=    2672=    2673=
U 10F8           2674=    2675=    2682=    2683=    2687=    2688=    2696=    2697=
U 1100           1825:    1826:    1827:    1828:    1829:    1830:    1831:    1832:
U 1108           1833:    1878     2708=    2709=    1834:    1835:    1836:    1837:
U 1110           2716=    2717=    2719=    2720=    2758=    2759=    2773=    2774=
U 1118           2783=    2784=    2793=    2794=    2796=    2797=    2806=    2807=
U 1120           2858=    2859=    2867=    2868=    2884=    2885=    2894=    2895=
U 1128           2904=    2905=    2907=    2908=    2916=    2917=    2925=    2926=
U 1130           2937=    2938=    2947=    2948=    2957=    2958=    2960=    2961=
U 1138           2969=    2970=    3002=    3006=    3015=    3016=    3039=    3040=
U 1140           3041=    3042=    3053=    3054=    3055=    3057=    3065=    3066=
U 1148           3069=    3070=    3072=    3073=    3080=    3081=    3093=    3094=
U 1150           3108=    3109=    3111=    3112=    1879     1922:    3115=    3116=
U 1158           3121=    3122=    3154=    3158=    3167=    3168=    3205=    3206=
U 1160           3207=    3208=    3219=    3220=    3221=    3223=    3231=    3232=
U 1168           3235=    3236=    3238=    3239=    3250=    3251=    3261=    3262=
U 1170           3276=    3277=    3279=    3280=    3283=    3284=    3287=    3288=
U 1178           1880     1881     1882     1883     2204:    2205:    2206:    2207:
U 1180           1884     1885     1886     1887     1888     1889     1890     1891
U 1188           1892     1893     1894     1895     1897     1898     1930     1931
U 1190           1937     1938     1939     1944     1947     1950     1951     1952
U 1198           1953     1956     1957     1958     1979     1980     1990     2001
```

```
ZZ-ESKAH-V132  Line Number Index                                                        SEQ 0505
ESKAH2A.MCR                     MICRO2  1M(01)     16-DEC-82  11:11:44                  Page  8

;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0           2002    2003    2009    2010    2011    2012    2013    2014
U 11A8           2015    2020    2021    2022    2023    2024    2025    2026
U 11B0           2027    2030    2031    2036    2037    2038    2039    2040
U 11B8           2041    2042    2043    2047    2048    2057    2058    2059
U 11C0           2060    2061    2062    2063    2064    2065    2068    2071
U 11C8           2072    2073    2077    2079    2080    2081    2082    2083
U 11D0           2084    2085    2086    2087    2088    2089    2090    2091
U 11D8           2092    2093    2094    2095    2096    2097    2098    2099
U 11E0           2100    2104    2110    2114    2120    2124    2128    2154
U 11E8           2155    2156    2157    2158    2159    2160    2161    2162
U 11F0           2163    2166    2167    2170    2175    2176    2179    2184
U 11F8           2185    2188    2193    2194    2208:   2209:   2210:   2211:
U 1200           2197    2203    2221    2222    2223    2224    2225    2226
U 1208           2227    2228    2229    2230    2233    2234    2238    2239
U 1210           2240    2241    2248    2249    2250    2251    2254    2255
U 1218           2259    2260    2262    2263    2267    2268    2269    2270
U 1220           2271    2272    2273    2274    2275    2282    2283    2284
U 1228           2285    2286    2287    2288    2291    2293    2294    2295
U 1230           2296    2297    2299    2300    2301    2302    2306    2307
U 1238           2309    2310    2311    2343    2346    2347    2348    2349
U 1240           2350    2353    2356    2357    2358    2359    2360    2361
U 1248           2362    2363    2364    2365    2368    2369    2370    2371
U 1250           2374    2377    2378    2379    2380    2381    2382    2383
U 1258           2384    2385    2386    2390    2391    2392    2401    2439
U 1260           2440    2441    2442    2445    2446    2447    2450    2451
U 1268           2452    2453    2454    2455    2458    2459    2470    2473
U 1270           2474    2475    2476    2477    2478    2481    2519    2520
U 1278           2521    2522    2525    2526    2527    2530    2531    2532
U 1280           2533    2534    2535    2538    2539    2550    2553    2554
U 1288           2555    2556    2557    2558    2561    2598    2599    2600
U 1290           2601    2602    2603    2606    2607    2608    2611    2612
U 1298           2613    2614    2615    2616    2617    2628    2631    2632
U 12A0           2633    2634    2635    2636    2639    2676    2677    2678
U 12A8           2679    2680    1923:   2681    2684    2685    2686    2689
U 12B0           2690    2691    2692    2693    2694    2695    2706    2707
U 12B8           2710    2711    2712    2713    2714    2715    2718    2760
U 12C0           2761    2762    2763    2764    2765    2766    2767    2768
U 12C8           2769    2770    2771    2772    2775    2776    2777    2778
U 12D0           2779    2781    2782    2785    2786    2787    2788    2789
U 12D8           2790    2791    2792    2795    2798    2802    2803    2804
U 12E0           2805    2809    2810    2811    2860    2861    2862    2869
U 12E8           2870    2871    2872    2873    2874    2875    2876    2877
U 12F0           2878    2879    2880    2881    2882    2883    2886    2887
U 12F8           2888    2889    2890    2891    2892    2893    2896    2897
U 1300           2899    2900    2901    2902    2903    2906    2909    2913
U 1308           2914    2915    2919    2927    2928    2929    2930    2931
U 1310           2932    2933    2934    2935    2936    2939    2940    2941
U 1318           2942    2943    2944    2945    2946    2949    2950    2952
U 1320           2953    2954    2955    2956    2959    2962    2966    2967
U 1328           2968    2972    2973    3007    3008    3009    3010    3011
U 1330           3012    3013    3014    3017    3018    3019    3020    3027
U 1338           3030    3033    3034    3035    3036    3037    3038    3047
U 1340           3048    3049    3050    3051    3052    3062    3063    3064
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348           3067    3068    3071    3074    3075    3076    3077    3078
U 1350           3079    3083    3084    3085    3086    3087    3088    3089
U 1358           3091    3092    3095    3096    3097    3098    3099    3100
U 1360           3101    3102    3103    3104    3105    3106    3107    3117
U 1368           3118    3119    3120    3124    3125    3126    3127    3128
U 1370           3129    3159    3160    3161    3162    3163    3164    3165
U 1378           3166    3169    3170    3171    3172    3173    3174    3175
U 1380           3176    3177    3179    3180    3181    3182    3183    3184
U 1388           3185    3186    3193    3196    3199    3200    3201    3202
U 1390           3203    3204    3213    3214    3215    3216    3217    3218
U 1398           3228    3229    3230    3233    3234    3237    3240    3241
U 13A0           3242    3243    3244    3245    3246    3247    3248    3249
U 13A8           3253    3254    3255    3256    3257    3259    3260    3263
U 13B0           3264    3265    3266    3267    3268    3269    3270    3271
U 13B8           3272    3273    3274    3275    3285    3286    3290    3291
U 13C0           3292    3293    3294    3295
U 13C8 - 13EF Unused
U 13F0           1906:   1907:   1908:   1909:   1910:   1911:   1912:   1913:
U 13F8           1914:   1915:   1916:   1917:   1918:   1919:   1920:   1921:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH2A        980

Used             980
Remaining

Total microwords used in memory U: 980
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH2A.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

; 3 Control ROM Field Definitions
; 548 Register Transfer Macro Definitions
; 1413 Non-transfer Functions
; 1485 Branch Enable Macro Definitions
; 1564 MICRO DIAGNOSTIC DEFINED MACROS
; 1813 MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 1953 TEST BC BRANCH ENABLE 11 -- LAST REFERANCE
; 2072 TEST BD TB ERROR REGISTER 0 BITS <15:10>

```
;1      .NOLIST
;1804   .LIST
;1805
```

```
                                          ;1806   ;+
                                          ;1807   ; FOLLOWING IS A SPECIAL MICRO CODE FIELD DEFINITION USED IN THE TEST
                                          ;1808   ; FOR TB ERROR REGISTER BITS <15:10>
                                          ;1809   ;-
                                          ;1810   SPECIAL/=<47:42>
                                          ;1811           PATTERN1=2B
                                          ;1812           PATTERN2=35
                                          ;1813           .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                          ;1814   .REGION/1000,13FF
                                          ;1815   ;+
                                          ;1816   ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                          ;1817   ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                          ;1818   ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                          ;1819   ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                          ;1820   ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                          ;1821   ;
                                          ;1822   ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                          ;1823   ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                          ;1824   ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                          ;1825   ;       R[OF] AND DO A RETURNO.
                                          ;1826   ;
                                          ;1827   ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                          ;1828   ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                          ;1829   ; TO THE CONSOLE.
                                          ;1830   ;
                                          ;1831   ;-
 U 1100, 0000,003C,1980,0800,0084,7003    ;1832   1100:   SC_K[ZERO],J/TRPH1        ; SYSTEM INIT
|U 1101, 0000,003C,0580,0800,0084,7001    ;1833   1101:   SC_K[.1],J/TRPH0          ; DATA UNALIGNED
|U 1102, 0000,003C,0980,0800,0084,7001    ;1834   1102:   SC_K[.2],J/TRPH0          ; X PAGE ERROR
|U 1103, 0000,003C,0D80,0800,0084,7001    ;1835   1103:   SC_K[.3],J/TRPH0          ; TB MODIFY
|U 1104, 0000,003C,1180,0800,0084,7001    ;1836   1104:   SC_K[.4],J/TRPH0          ; TB PROT ERROR
|U 1105, 0000,003C,D580,0800,0084,7001    ;1837   1105:   SC_K[.6],J/TRPH0          ; TB MISS
|U 1106, 0000,003C,D980,0800,0084,7001    ;1838   1106:   SC_K[.9],J/TRPH0          ; RES FLOAT OPER
|U 1107, 0000,003C,5D80,0800,0084,7001    ;1839   1107:   SC_K[.7],J/TRPH0          ; TB PARITY
|U 1108, 0000,003C,0180,0800,0084,7001    ;1840   1108:   SC_K[.8],J/TRPH0          ; CACHE PARITY
|U 110C, 0000,003C,8580,0800,0084,7003    ;1841   110C:   SC_K[.C],J/TRPH1          ; RDS
|U 110D, 0000,003C,8980,0800,0084,7003    ;1842   110D:   SC_K[.D],J/TRPH1          ; TIME OUT
|U 110E, 0000,003C,6580,0800,0084,7001    ;1843   110E:   SC_K[.10],J/TRPH0         ; ODD ADDRESS
|U 110F, 0000,003C,6180,0800,0084,7003    ;1844   110F:   SC_K[.F],J/TRPH1          ; CS PARITY
|U 1001, 0000,003C,81F0,2C00,0000,104F    ;1845   TRPH0:  Q_ID[USTACK]
|U 104F, 0C00,003C,01E0,0800,0000,1056    ;1846           Q_D,D_Q
|U 1056, 0000,003C,8180,3C00,0000,1057    ;1847           ID[USTACK]_D
|U 1057, 0C00,003C,01E0,0800,0000,1058    ;1848           Q_D,D_Q
|U 1058, 0000,003C,01C0,0A78,0000,1059    ;1849           Q_R[OF]
|U 1059, 0001,2024,0180,0800,0010,105B    ;1850           A[U_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
 U 105B, 0000,013C,0180,0800,0000,1002    ;1851           Z?                              ; BRANCH IF NO
 U 1002, 0001,2036,0180,0AF8,0000,0000    ;1852   =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN
                                          ;1853   ;+
                                          ;1854   ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                          ;1855   ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                          ;1856   ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                          ;1857   ;
                                          ;1858   ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                          ;1859   ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                          ;1860   ;             FAULT STATUS REGISTER
```

```
                                         ;               SBI ERROR REGISTER
                                         ;               TIMEOUT ADDRESS REGISTER
                                         ;               MAINTENANCE REGISTER
                                         ;               CACHE PARITY REGISTER
                                         ;               TB ERROR REGISTER 1
                                         ;               TB ERROR REGISTER 0
                                         ;-
U 1003, 0018,0038,1D80,09E8,0000,1004    TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,707E    =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,105C            Q_ID[TBER0]
U 105C, 0001,203C,4DF0,2DB0,0000,105D            RC[6]_Q,Q_ID[TBER1]
U 105D, 0001,203C,65F0,2DB8,0000,105F            RC[7]_Q,Q_ID[SBI.ERR]
U 105F, 0001,203C,6DF0,2DD8,0000,1060            RC[0B]_Q,Q_ID[FAULT]
U 1060, 0001,203C,75F0,2DE0,0000,1061            RC[0C]_Q,Q_ID[MAINT]
U 1061, 0001,203C,79F0,2DC8,0000,1062            RC[9]_Q,Q_ID[PARITY]
U 1062, 0001,203C,69F0,2DC0,0000,1063            RC[8]_Q,Q_ID[TIME.ADDR]
U 1063, 0001,203C,81F0,2DD0,0000,1000            RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1078    1000:   RC[0E]_Q,ERROR1
                                         ;+
                                         ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                         ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                         ;                 NEWTST
                                         ;                 ERLOOP
                                         ;                 ERROR1
                                         ;                 ERROR2
                                         ;
U 1064, 0000,003C,65F8,0800,0084,7065    SCOPE:  SC_K[.10],Q_0                  ; SETUP TO WRITE IPL OF 1F
U 1065, 0818,0038,8D80,0800,0000,1066            D_K[.1F]                       ; ...
U 1066, 0D00,003C,0180,0800,0000,1067            D_DAL.SC
U 1067, 0000,003C,3D80,3C00,0000,1068            ID[PSL]_D                      ; WRITE THE PSL
U 1068, 0818,0038,0580,0800,0000,1069            D_K[.1]                        ; SETUP TO CLEAR THE CES REGISTER
U 1069, 0D00,003C,0180,0800,0000,106A            D_DAL.SC
U 106A, 0F00,003C,3180,3C00,0000,106B            ID[CES]_D,D_0                  ; CLEAR THE CES REGISTER
U 106B, 0000,003C,5D80,3C00,0000,106C            ID[ACC.CS]_D                   ; SHUT OFF THE FLOATING POINT
U 106C, 0000,003C,3980,3C00,0000,106D            ID[SIR]_D                      ; CLEAR THE SIR REGISTER
U 106D, 0000,003C,2980,3C00,0000,106E            ID[CLK.CS]_D                   ; STOP INTERVAL TIMER
U 106E, 0000,003C,4980,3C00,0000,106F            ID[TBER0]_D                    ; SHUT OFF THE TB
U 106F, 0818,0038,C180,0800,0000,1070            D_K[.FFFF]
U 1070, 0000,003C,6580,3C00,0000,1071            ID[SBI.ERR]_D
U 1071, 0F00,003C,6D80,3C00,0000,1072            ID[FAULT]_D,D_0
U 1072, 0000,003C,6D80,3C00,0000,1073            ID[FAULT]_D
U 1073, 0000,003C,6580,3C00,0000,1074            ID[SBI.ERR]_D
U 1074, 0003,003C,0180,09F0,0000,1075            RC[0E]_0
U 1075, 0003,003C,0180,0AF8,0000,1076            R[0F]_0
U 1076, 0003,003C,0180,09E8,0000,105E            RC[0D]_0,J/CALLCON             ; CALL THE CONSOLE
U 1077, 0818,0038,0980,0800,0000,105E    ERLOOP: D_K[.2],J/CALLCON              ; ERRLOOP CALL
U 1078, 0810,0038,0180,0978,0000,1079    ERROR1: D_RC[0F]
U 1079, 0819,0034,4D80,0800,0000,104E            D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E    104E:   D_D.OR.K[.4],J/CALLCON
U 107A, 0810,0038,0180,0978,C000,107B    ERROR2: D_RC[0F]
U 107B, 0819,0034,4D80,0800,0000,105A            D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E    105A:   D_D.OR.K[.6],J/CALLCON
                                         105E:
                                         CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E            ID[TXDB]_D,J/CALLCON           ; CALL THE CONSOLE
```

```
                                           ;1916    ;+
                                           ;1917    ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                           ;1918    ;-
U 13F0, 0000,003C,0180,0800,0000,13F1      ;1919    13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2      ;1920    13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3      ;1921    13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4      ;1922    13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5      ;1923    13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6      ;1924    13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7      ;1925    13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8      ;1926    13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9      ;1927    13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA      ;1928    13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB      ;1929    13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC      ;1930    13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD      ;1931    13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE      ;1932    13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF      ;1933    13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155      ;1934    13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA      ;1935    1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,107C      ;1936    12AA:   NOP
                                           ;1937    ;+
                                           ;1938    ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                           ;1939    ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                           ;1940    ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                           ;1941    ; TYPING IT.
                                           ;1942    ;-
U 107C, 0810,0038,4D80,0978,0000,107D      ;1943    SUBTST: D_RC[OF],KMX/.FF00
U 107D, 0019,4016,4D80,09F8,0000,0001      ;1944            RC[OF]_D+K[.FF00],WORD,RETURN1
                                           ;1945    ;+
                                           ;1946    ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                           ;1947    ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                           ;1948    ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                           ;1949    ;-
U 107E, 0010,0038,01C0,0978,0000,107F      ;1950    SETRCF: Q_RC[OF]
U 107F, 0019,2034,4DC0,0800,0000,1080      ;1951            Q_Q.AND.K[.FF00]
U 1080, 0019,2032,1D80,09F8,0000,0001      ;1952            RC[OF]_Q.OR.SC,RETURN1
```

```
                                            ;1953           .PAGE   ''TEST BC        BRANCH ENABLE 11 -- LAST REFERANCE''
                                            ;1954    ;*******************************************************************
                                            ;1955    ;++
                                            ;1956    ;
                                            ;1957    ; TEST  BC      BRANCH ENABLE 11 -- LAST REFERANCE
                                            ;1958    ;
                                            ;1959    ; TEST DESCRIPTION
                                            ;1960    ;
                                            ;1961    ;      THIS TEST CHECKS BRANCH ENABLE 11.
                                            ;1962    ;
                                            ;1963    ;      SUBTEST 1 - CHECK THAT CODE 0 ASSERTS WITH ''READ.V.WCHK
                                            ;1964    ;
                                            ;1965    ;      SUBTEST 2 - CHECK THAT CODE 1 ASSERT WITH ''LOCKWRITE.V.XCHK''
                                            ;1966    ;
                                            ;1967    ;      SUBTEST 3 - CHECK THAT CODE 0 AND 1 ASSERT WITH 'WRITE.V.WCHK''
                                            ;1968    ;
                                            ;1969    ;      SUBTEST 4 - CHECK THAT CODE 0 DOES NOT ASSERT WITH UMCT2 & 3 TRUE
                                            ;1970    ;
                                            ;1971    ;      SUBTEST 5 - CHECK THAT CODE 0 DOES NOT ASSERT WITH 'WRITE CHECK'' FALSE
                                            ;1972    ;
                                            ;1973    ; LOGIC DESCRIPTION
                                            ;1974    ;
                                            ;1975    ;      THIS TEST CHECKS THE LOGIC ON THE TBM AND USC MODULE THAT GENERATE
                                            ;1976    ;      THE SIGNALS ''LAST REF CODE 0 & 1''.
                                            ;1977    ;
                                            ;1978    ; ERROR DESCRIPTION
                                            ;1979    ;
                                            ;1980    ;      DATA: EXPECTED BRANCH BITS 0 AND 1
                                            ;1981    ;            RECEIVED BRANCH BITS 0 AND 1
                                            ;1982    ;
                                            ;1983    ; SYNC POINT DESCRIPTION
                                            ;1984    ;
                                            ;1985    ;      SUBTEST 1 - SYNC00--LAST REF CODE IS LATCHED
                                            ;1986    ;      SUBTEST 2 - SYNC01--LAST REF CODE IS LATCHED
                                            ;1987    ;      SUBTEST 3 - SYNC02--LAST REF CODE IS LATCHED
                                            ;1988    ;      SUBTEST 4 - SYNC03--LAST REF CODE IS LATCHED
                                            ;1989    ;      SUBTEST 5 - SYNC04--LAST REF CODE IS LATCHED
                                            ;1990    ;--
                                            ;1991    ;*******************************************************************
                                            ;1992    =0
U 1006, 0018,0039,0980,09F8,0000,1064       ;1993    T001:  NEWTST[.2]
U 1007, 0003,003C,0180,0800,0200,1081       ;1994           VA_ALU,ALU_0(A)
U 1081, 0818,0038,B980,0800,0000,1082       ;1995           D_K[.19]
U 1082, 0000,003C,85F8,0800,0084,7083       ;1996           SC_K[.C],Q_0
U 1083, 0D00,003C,0180,0800,0000,1084       ;1997           D_DAL.SC
U 1084, 0F00,003C,7580,3C00,0000,1085       ;1998           ID[MAINT]_D,D_0
U 1085, 0000,003C,4980,3C00,0000,1008       ;1999           ID[TBER0]_D                    ; SHUT OFF THE TB
                                            ;2000    ;///////////////////////////////////////////////////////////////////
                                            ;2001    ;+
                                            ;2002    ; CHECK ''LAST REF CODE 0'' TRUE WITH A READ.V.WCHK FUNCTION
                                            ;2003    ;-
U 1008, 0000,003D,0180,0800,0000,107C       ;2004    =0     SUBTEST
U 1009, 0018,0038,0980,09F0,0000,100A       ;2005           RC[0E]_K[.2]                   ; SET THE EXPECTED DATA
U 100A, 0000,003D,0180,0800,0000,1077       ;2006    =0     ERLOOP
U 100B, 0000,003C,0180,5000,0000,1010       ;2007    SYNC00: MCT/READ.V.WCHK               ; EXECUTE THE FUNCTION
```

```
U 1010, 0818,1139,0980,0800,0000,100C   ;2008   =0      LAST.REF?,CALL,J/BEN11,D_K[.2]  ; CHECK THE BRANCH BITS
U 1011, 001D,2000,0180,0800,0010,1086   ;2009           ALU_Q-D,CLK.UBCC                ; CHECK FOR CODE 0
U 1086, 0000,013C,0180,0800,0000,1012   ;2010           Z?
U 1012, 0001,203D,0180,09E8,0000,107A   ;2011   =0      ERROR2,RC[0D]_Q                 ; BRANCH FAILED
U 1013, 0000,003C,0180,0800,0000,1014   ;2012           NOP
                                        ;2013   ;//////////////////////////////////////////////////////////////////////
                                        ;2014   ;+
                                        ;2015   ; CHECK "LAST REF CODE 1" TRUE WITH A LOCKWRITE.V.XCHK FUNCTION
                                        ;2016   ;-
U 1014, 0000,003D,0180,0800,0000,107C   ;2017   =0      SUBTEST
U 1015, 0018,0038,0580,09F0,0000,1087   ;2018           RC[0E]_K[.1]
U 1087, 0018,0038,4180,0800,0200,1016   ;2019           VA_ALU,ALU_K[.80]               ; SET THE VA
U 1016, 0000,003D,0180,0800,0000,1077   ;2020   =0      ERLOOP
U 1017, 0000,003C,0180,3800,0000,1018   ;2021   SYNC01: MCT/LOCKWRITE.V.XCHK            ; EXECUTE THE FUNCTION
U 1018, 0818,1139,0580,0800,0000,100C   ;2022   =0      LAST.REF?,CALL,J/BEN11,D_K[.1]  ; EXECUTE THE BRANCH
U 1019, 001D,2000,0180,0800,0010,1088   ;2023           ALU_Q-D,CLK.UBCC                ; CHECK THE RESULT
U 1088, 0000,013C,0180,0800,0000,101A   ;2024           Z?
U 101A, 0001,203D,0180,09E8,0000,107A   ;2025   =0      ERROR2,RC[0D]_Q                 ; BRANCH FAILED
U 101B, 0000,003C,0180,0800,0000,101C   ;2026           NOP
                                        ;2027   ;//////////////////////////////////////////////////////////////////////
                                        ;2028   ;+
                                        ;2029   ; CHECK "LAST REF CODE 0 & 1" TRUE WITH WRITE.V.WCHK FUNCTION
                                        ;2030   ;-
U 101C, 0000,003D,0180,0800,0000,107C   ;2031   =0      SUBTEST
U 101D, 0018,0038,0D80,09F0,0000,101E   ;2032           RC[0E]_K[.3]
U 101E, 0000,003D,0180,0800,0000,1077   ;2033   =0      ERLOOP
U 101F, 0000,003C,0180,3000,0000,1020   ;2034   SYNC02: MCT/WRITE.V.WCHK                ; EXECUTE THE FUNCTION
U 1020, 0818,1139,0D80,0800,0000,100C   ;2035   =0      LAST.REF?,CALL,J/BEN11,D_K[.3]  ; EXECUTE THE BRANCH
U 1021, 001D,2000,0180,0800,0010,1089   ;2036           ALU_Q-D,CLK.UBCC                ; CHECK THE RESULT
U 1089, 0000,013C,0180,0800,0000,1022   ;2037           Z?
U 1022, 0001,203D,0180,09E8,0000,107A   ;2038   =0      ERROR2,RC[0D]_Q                 ; BRANCH FAILED
U 1023, 0000,003C,0180,0800,0000,1024   ;2039           NOP
                                        ;2040   ;//////////////////////////////////////////////////////////////////////
                                        ;2041   ;+
                                        ;2042   ; CHECK "LAST REF CODE 0" FALSE WITH UMCT 2 AND 3 ENABLED
                                        ;2043   ;-
U 1024, 0000,003D,0180,0800,0000,107C   ;2044   =0      SUBTEST
U 1025, 0018,0038,0580,09F0,0000,1026   ;2045           RC[0E]_K[.1]
U 1026, 0000,003D,0180,0800,0000,1077   ;2046   =0      ERLOOP
U 1027, 0000,003C,0180,7000,0000,1028   ;2047   SYNC03: MCT/LOCKREAD.V.WCHK             ; EXECUTE THE FUNCTION
U 1028, 0818,1139,0580,0800,0000,100C   ;2048   =0      LAST.REF?,CALL,J/BEN11,D_K[.1]  ; EXECUTE THE BRANCH
U 1029, 001D,2000,0180,0800,0010,108A   ;2049           ALU_Q-D,CLK.UBCC                ; CHECK THE RESULT
U 108A, 0000,013C,0180,0800,0000,102A   ;2050           Z?
U 102A, 0001,203D,0180,09E8,0000,107A   ;2051   =0      ERROR2,RC[0D]_Q                 ; BRANCH FAILED
U 102B, 0000,003C,0180,0800,0000,102C   ;2052           NOP
                                        ;2053   ;//////////////////////////////////////////////////////////////////////
                                        ;2054   ;+
                                        ;2055   ; CHECK THAT CODE 0 DOES NOT ASSERT WITH "WRITE CHECK" FALSE
                                        ;2056   ;-
U 102C, 0000,003D,0180,0800,0000,107C   ;2057   =0      SUBTEST
U 102D, 0003,003C,0180,09F0,0000,102E   ;2058           RC[0E]_0
U 102E, 0000,003D,0180,0800,0000,1077   ;2059   =0      ERLOOP
U 102F, 0000,003C,0180,4000,0000,1030   ;2060   SYNC04: MCT/READ.V.RCHK                 ; EXECUTE THE FUNCTION
U 1030, 0F00,113D,0180,0800,0000,100C   ;2061   =0      LAST.REF?,CALL,J/BEN11,D_0      ; EXECUTE THE BRANCH
U 1031, 001D,2000,0180,0800,0010,108B   ;2062           ALU_Q-D,CLK.UBCC                ; CHECK THE RESULT
```

```
U 108B, 0000,013C,0180,0800,0000,1032   ;2063               Z?
U 1032, 0001,203D,0180,09E8,0000,107A   ;2064     =0        ERROR2,RC[0D]_Q                     ; BRANCH FAILED
U 1033, 0000,003C,0180,0800,0000,108C   ;2065               J/ENDT001
                                        ;2066     =1100
U 100C, 0000,003E,01F8,0800,0000,0001   ;2067     BEN11:    Q_0,RETURN1
U 100D, 0018,003A,05C0,0800,0000,0001   ;2068               Q_K[.1],RETURN1
U 100E, 0018,003A,09C0,0800,0000,0001   ;2069               Q_K[.2],RETURN1
U 100F, 0018,003A,0DC0,0800,0000,0001   ;2070               Q_K[.3],RETURN1
U 108C, 0000,003C,0180,0800,0000,1034   ;2071     ENDT001:NOP
```

```
                                          ;2072          .PAGE   "TEST BD        TB ERROR REGISTER 0 BITS <15:10>"
                                          ;2073    ;**********************************************************************
                                          ;2074    ;++
                                          ;2075    ;
                                          ;2076    ; TEST  BD       TB ERROR REGISTER 0 BITS <15:10>
                                          ;2077    ;
                                          ;2078    ; TEST DESCRIPTION
                                          ;2079    ;
                                          ;2080    ;       THIS TEST CHECKS THAT BITS <15:10> OF TB ERROR REGISTER 0 CAN BE
                                          ;2081    ;       SET AND CLEARED CORRECTLY.
                                          ;2082    ;
                                          ;2083    ;       SUBTEST 1 - CHECK BITS <15:10>=001010 LOADED BY "EN TB PAR"
                                          ;2084    ;
                                          ;2085    ;       SUBTEST 2 - CHECK BITS <15:10>=010101 LOADED BY "UADS"
                                          ;2086    ;
                                          ;2087    ;       SUBTEST 3 - CHECK BITS <15:10>=001100 LOADED BY "UNEWPC"
                                          ;2088    ;
                                          ;2089    ;       SUBTEST 4 - CHECK BITS <15:10>=110101 LOADED BY "UADS"
                                          ;2090    ;
                                          ;2091    ;       SUBTEST 5 - CHECK BITS <15:10>=111010 LOADED BY "UADS"
                                          ;2092    ;
                                          ;2093    ; LOGIC DESCRIPTION
                                          ;2094    ;
                                          ;2095    ;       THIS TEST CHECKS BITS <15:10> OF THE TB ERROR REGISTER 0 ON THE
                                          ;2096    ;       TBM MODULE.
                                          ;2097    ;
                                          ;2098    ; ERROR DESCRIPTION
                                          ;2099    ;
                                          ;2100    ;       DATA: EXPECTED VALUD OF BITS <15:10>
                                          ;2101    ;             RECEIVED VALUE OF BITS <15:10>
                                          ;2102    ;--
                                          ;2103    ;**********************************************************************
                                          ;2104    =0
U 1034, 0018,0039,0980,09F8,0000,1064     ;2105    T005:   NEWTST[.2]
U 1035, 0F00,003C,0180,0800,0000,108D     ;2106            D_0                             ; SHUT OFF THE TB
U 108D, 0000,003C,4980,3C00,0000,108E     ;2107            ID[TBER0]_D
U 108E, 0818,0038,F180,0800,0000,108F     ;2108            D_K[.FFFC]                      ; GENERATE MASK FOR BITS <15:10>
U 108F, 0819,0034,4980,0800,0000,1090     ;2109            D_D.AND.K[.FF]
U 1090, 0000,003C,01F8,0800,0084,7091     ;2110            SC_K[.8],Q_0
U 1091, 0D00,003C,0180,0800,0000,1092     ;2111            D_DAL.SC
U 1092, 0001,003C,0180,0A80,0000,1036     ;2112            R[0]_D                          ; SAVE
                                          ;2113    ;//////////////////////////////////////////////////////////////////////
                                          ;2114    ;+
                                          ;2115    ; FIRST CHECK BITS <15:10>=001010 (READ.V.WCHK)
                                          ;2116    ;-
U 1036, 0000,003D,0180,0800,0000,107C     ;2117    =0      SUBTEST
U 1037, 0818,0038,F5F8,0800,0084,7093     ;2118            D_K[.A],SC_K[.A],Q_0            ; GENERATE EXPECTED DATA
U 1093, 0D00,003C,0180,0800,0000,1094     ;2119            D_DAL.SC
U 1094, 0001,003C,0180,09F0,0000,1038     ;2120            RC[0E]_D                        ; EQUALS 2800
U 1038, 0000,003D,0180,0800,0000,1077     ;2121    =0      ERLOOP
U 1039, 0000,003C,0180,5000,0000,1095     ;2122            MCT/READ.V.WCHK                 ; EXECUTE THE FUNCTION
U 1095, 0810,0038,49F0,2D70,0000,1096     ;2123            Q_ID[TBER0],D_RC[0E]            ; READ THE ERROR REGISTER
U 1096, 001C,0034,01C0,0A00,0000,1097     ;2124            Q_Q.AND.R[0]                    ; MASK
U 1097, 001D,2000,0180,0800,0010,1098     ;2125            A[U_Q-D,CLK.UBCC                ; CHECK
U 1098, 0000,013C,0180,0800,0000,103A     ;2126            Z?
```

```
U 103A, 0001,203D,0180,09E8,0000,107A   ;2127   =0      ERROR2,RC[OD]_Q                 ; ERROR REGISTER INCORRECT
U 103B, 0000,003C,0180,0800,0000,103C   ;2128           NOP
                                        ;2129   ;//////////////////////////////////////////////////////////////////
                                        ;2130   ;+
                                        ;2131   ; CHECK ERROR REGISTER BITS <15:10>=010101 (WRITE.P)
                                        ;2132   ;-
U 103C, 0000,003D,0180,0800,0000,107C   ;2133   =0      SUBTEST
U 103D, 0818,0038,2180,0800,0000,1099   ;2134           D_K[.14]
U 1099, 0819,0014,0580,0800,0000,109A   ;2135           D_D+K[.1]
U 109A, 0000,003C,F5F8,0800,0084,709B   ;2136           SC_K[.A],Q_0
U 109B, 0D00,003C,0180,0800,0000,109C   ;2137           D_DAL.SC
U 109C, 0001,003C,0180,09F0,0000,103E   ;2138           RC[OE]_D                        ; SAVE EXPECTED DTAA = 5400
U 103E, 0000,003D,0180,0800,0000,1077   ;2139   =0      ERLOOP
U 103F, 0000,003C,0180,A800,0000,109D   ;2140           MCT/WRITE.P                     ; EXECUTE THE FUNCTION
U 109D, 0810,0038,49F0,2D70,0000,109E   ;2141           Q_ID[TBER0],D_RC[OE]            ; READ THE ERROR REGISTER
U 109E, 001C,0034,01C0,0A00,0000,109F   ;2142           Q_Q.AND.R[0]                    ; MASK
U 109F, 001D,2000,0180,0800,0010,10A0   ;2143           A[U_Q-D,CLK.UBCC                ; CEHCK
U 10A0, 0000,013C,0180,0800,0000,1040   ;2144           Z?
U 1040, 0001,203D,0180,09E8,0000,107A   ;2145   =0      ERROR2,RC[OD]_Q                 ; ERROR REGISTER INCORRECT
U 1041, 0000,003C,0180,0800,0000,1042   ;2146           NOP
                                        ;2147   ;//////////////////////////////////////////////////////////////////
                                        ;2148   ;+
                                        ;2149   ; CHECK ERROR REGISTER BITS <15:10>=001100 (READ.V.NEWPC)
                                        ;2150   ;-
U 1042, 0000,003D,0180,0800,0000,107C   ;2151   =0      SUBTEST
U 1043, 0818,0038,8580,0800,0000,10A1   ;2152           D_K[.C]
U 10A1, 0000,003C,F5F8,0800,0084,70A2   ;2153           SC_K[.A],Q_0
U 10A2, 0D00,003C,0180,0800,0000,10A3   ;2154           D_DAL.SC
U 10A3, 0001,003C,0180,09F0,0000,1044   ;2155           RC[OE]_D                        ; SAVE EXPECTED DATA = 3000
U 1044, 0000,003D,0180,0800,0000,1077   ;2156   =0      ERLOOP
U 1045, 0000,003C,0180,6000,0000,10A4   ;2157           MCT/READ.V.NEWPC                ; EXECUTE THE FUNCTION
U 10A4, 0810,0038,49F0,2D70,0000,10A5   ;2158           Q_ID[TBER0],D_RC[OE]            ; READ THE REGISTER
U 10A5, 001C,0034,01C0,0A00,0000,10A6   ;2159           Q_Q.AND.R[0]                    ; MASK
U 10A6, 001D,2000,0180,0800,0010,10A7   ;2160           A[U_Q-D,CLK.UBCC                ; CEHCK
U 10A7, 0000,013C,0180,0800,0000,1046   ;2161           Z?
U 1046, 0001,203D,0180,09E8,0000,107A   ;2162   =0      ERROR2,RC[OD]_Q                 ; ERROR REGISTER INCORRECT
U 1047, 0000,003C,0180,0800,0000,1048   ;2163           NOP
                                        ;2164   ;//////////////////////////////////////////////////////////////////
                                        ;2165   ;+
                                        ;2166   ; CHECK ERROR REGISTER BITS <15:10>=110101 (SPECIAL/PATTERN1)
                                        ;2167   ;-
U 1048, 0000,003D,0180,0800,0000,107C   ;2168   =0      SUBTEST
U 1049, 0818,0038,2980,0800,0000,10A8   ;2169           D_K[.34]
U 10A8, 0819,0014,0580,0800,0000,10A9   ;2170           D_D+K[.1]
U 10A9, 0000,003C,F5F8,0800,0084,70AA   ;2171           SC_K[.A],Q_0
U 10AA, 0D00,003C,0180,0800,0000,10AB   ;2172           D_DAL.SC
U 10AB, 0001,003C,0180,09F0,0000,104A   ;2173           RC[OE]_D                        ; SAVE EXPECTED DATA = D400
U 104A, 0000,003D,0180,0800,0000,1077   ;2174   =0      ERLOOP
U 104B, 0000,003C,0180,AC00,0000,10AC   ;2175           SPECIAL/PATTERN1                ; EXECUTE THE FUNCTION
U 10AC, 0810,0038,49F0,2D70,0000,10AD   ;2176           Q_ID[TBER0],D_RC[OE]            ; READ THE REGISTER
U 10AD, 001C,0034,01C0,0A00,0000,10AE   ;2177           Q_Q.AND.R[0]                    ; MASK
U 10AE, 001D,2000,0180,0800,0010,10AF   ;2178           A[U_Q-D,CLK.UBCC                ; CHECK
U 10AF, 0000,013C,0180,0800,0000,104C   ;2179           Z?
U 104C, 0001,203D,0180,09E8,0000,107A   ;2180   =0      ERROR2,RC[OD]_Q                 ; REGISTER INCORRECT
U 104D, 0000,003C,0180,0800,0000,1050   ;2181           NOP
```

```
                                  ;2182   ;//////////////////////////////////////////////////////////////////////
                                  ;2183   ;+
                                  ;2184   ; CHECK ERROR REGISTER BITS <15:10>=111010 (SPECIAL/PATTERN2)
                                  ;2185   ;-
U 1050, 0000,003D,0180,0800,0000,107C   ;2186   =0      SUBTEST
U 1051, 0818,0038,7980,0800,0000,10B0   ;2187           D_K[.30]
U 10B0, 0000,003C,F5F8,0800,0084,70B1   ;2188           SC_K[.A],Q_0
U 10B1, 0819,0014,F580,0800,0000,10B2   ;2189           D_D+K[.A]
U 10B2, 0D00,003C,0180,0800,0000,10B3   ;2190           D_DAL.SC
U 10B3, 0001,003C,0180,09F0,0000,1052   ;2191           RC[OE]_D                        ; SAVE EXPECTED DATA = E800
U 1052, 0000,003D,0180,0800,0000,1077   ;2192   =0      ERLOOP
U 1053, 0000,003C,0180,D400,0000,10B4   ;2193           SPECIAL/PATTERN2                ; EXECUTE THE FUNCTION
U 10B4, 0810,0038,49F0,2D70,0000,10B5   ;2194           Q_ID[TBERO],D_RC[OE]            ; READ THE REGISTER
U 10B5, 001C,0034,01C0,0A00,0000,10B6   ;2195           Q_Q.AND.R[0]                    ; MASK
U 10B6, 001D,2000,0180,0800,0010,10B7   ;2196           A[U_Q-D,CLK.UBCC                ; CHECK
U 10B7, 0000,013C,0180,0800,0000,1054   ;2197           Z?
U 1054, 0001,203D,0180,09E8,0000,107A   ;2198   =0      ERROR2,RC[OD]_Q                 ; REGISTER INCORRECT
U 1055, 0000,003C,0180,0800,0000,10B8   ;2199           NOP
U 10B8, 0000,003D,0180,0800,0000,1064   ;2200   DUM:    NEWTST
```

```
;                        Location / Line Number Index

;Location       0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000          1878:    1845     1852=    1868=    1869=    1870=    1993=    1994=
U 1008          2004=    2005=    2006=    2007=    2067=    2068=    2069=    2070=
U 1010          2008=    2009=    2011=    2012=    2017=    2018=    2020=    2021=
U 1018          2022=    2023=    2025=    2026=    2031=    2032=    2033=    2034=
U 1020          2035=    2036=    2038=    2039=    2044=    2045=    2046=    2047=
U 1028          2048=    2049=    2051=    2052=    2057=    2058=    2059=    2060=
U 1030          2061=    2062=    2064=    2065=    2105=    2106=    2117=    2118=
U 1038          2121=    2122=    2127=    2128=    2133=    2134=    2139=    2140=
U 1040          2145=    2146=    2151=    2152=    2156=    2157=    2162=    2163=
U 1048          2168=    2169=    2174=    2175=    2180=    2181=    1909:    1846
U 1050          2186=    2187=    2192=    2193=    2198=    2199=    1847     1848
U 1058          1849     1850     1912:    1851     1871     1872     1915:    1873
U 1060          1874     1875     1876     1877     1887     1888     1889     1890
U 1068          1891     1892     1893     1894     1895     1896     1897     1898
U 1070          1899     1900     1901     1902     1903     1904     1905     1906
U 1078          1907     1908     1910     1911     1943     1944     1950     1951
U 1080          1952     1995     1996     1997     1998     1999     2010     2019
U 1088          2024     2037     2050     2063     2071     2107     2108     2109
U 1090          2110     2111     2112     2119     2120     2123     2124     2125
U 1098          2126     2135     2136     2137     2138     2141     2142     2143
U 10A0          2144     2153     2154     2155     2158     2159     2160     2161
U 10A8          2170     2171     2172     2173     2176     2177     2178     2179
U 10B0          2188     2189     2190     2191     2194     2195     2196     2197
U 10B8          2200
U 10C0 - 10FF Unused
U 1100          1832:    1833:    1834:    1835:    1836:    1837:    1838:    1839:
U 1108          1840:                               1841:    1842:    1843:    1844:
U 1110 - 114F Unused
U 1150                                                       1935:
U 1158 - 12A7 Unused
U 12A8                            1936:
U 12B0 - 13EF Unused
U 13F0          1919:    1920:    1921:    1922:    1923:    1924:    1925:    1926:
U 13F8          1927:    1928:    1929:    1930:    1931:    1932:    1933:    1934:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH2B        216

Used             216
Remaining

Total microwords used in memory U: 216
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH2B.MIC

Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

; 3 Control ROM Field Definitions
; 548 Register Transfer Macro Definitions
; 1413 Non-transfer Functions
; 1485 Branch Enable Macro Definitions
; 1564 MICRO DIAGNOSTIC DEFINED MACROS
; 1806 MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2364 TEST BE ODD ADDRESS UTRAP TEST 1
; 2445 TEST BF ODD ADDRESS UTRAP TEST 2
; 2646 TEST C0 TB MISS UTRAPS TEST 1
; 2691 TEST C1 TB MISS UTRAPS TEST 2
; 2765 TEST C2 ACCESS VIOLATION UTRAPS TEST 1
; 2809 TEST C3 ACCESS VIOLATION UTRAPS TEST 2
; 2887 TEST C4 ACCESS VIOLATION UTRAPS TEST 3
; 2933 TEST C5 ACCESS VIOLATION UTRAPS TEST 4
; 3015 TEST C6 M BIT UTRAPS TEST 1
; 3057 TEST C7 M BIT UTRAPS TEST 2
; 3136 TEST C8 ALIGNMENT UTRAPS TEST 1
; 3173 TEST C9 ALIGNMENT UTRAPS TEST 2
; 3249 TEST CA CROSS PAGE UTRAPS TEST 1
; 3292 TEST CB CROSS PAGE UTRAPS TEST 2
; 3372 TEST CC TB PARITY UTRAPS TEST 1
; 3425 TEST CD TB PARITY UTRAPS TEST 2

```
;1        .NOLIST
;1804     .LIST
;1805
```

```
                                                       .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                                .REGION/1000,13FF
                                                ;+
                                                ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                                ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                                ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                                ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                                ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                                ;
                                                ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                                ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                                ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                                ;       R[OF] AND DO A RETURNO.
                                                ;
                                                ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                                ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                                ; TO THE CONSOLE.
                                                ;
                                                ;-
U 1100, 0000,003C,1980,0800,0084,7003           1100:   SC_K[ZERO],J/TRPH1          ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001           1101:   SC_K[.1],J/TRPHO            ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001           1102:   SC_K[.2],J/TRPHO            ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001           1103:   SC_K[.3],J/TRPHO            ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001           1104:   SC_K[.4],J/TRPHO            ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001           1105:   SC_K[.6],J/TRPHO            ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001           1106:   SC_K[.9],J/TRPHO            ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001           1107:   SC_K[.7],J/TRPHO            ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001           1108:   SC_K[.8],J/TRPHO            ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003           110C:   SC_K[.C],J/TRPH1            ; RDS
U 110D, 0000,003C,8980,0800,0084,7003           110D:   SC_K[.D],J/TRPH1            ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001           110E:   SC_K[.10],J/TRPHO           ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003           110F:   SC_K[.F],J/TRPH1            ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,101D           TRPHO:  Q_ID[USTACK]
U 101D, 0C00,003C,01E0,0800,0000,102F                   Q_D,D_Q
U 102F, 0000,003C,8180,3C00,0000,1038                   ID[USTACK]_D
U 1038, 0C00,003C,01E0,0800,0000,103F                   Q_D,D_Q
U 103F, 0000,003C,01C0,0A78,0000,1045                   Q_R[OF]
U 1045, 0001,2024,0180,0800,0010,104F                   A[U_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 104F, 0000,013C,0180,0800,0000,1002                   Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000           =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN
                                                ;+
                                                ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                                ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                                ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                                ;
                                                ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                                ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                                ;             FAULT STATUS REGISTER
                                                ;             SBI ERROR REGISTER
                                                ;             TIMEOUT ADDRESS REGISTER
                                                ;             MAINTENANCE REGISTER
                                                ;             CACHE PARITY REGISTER
                                                ;             TB ERROR REGISTER 1
                                                ;             TB ERROR REGISTER 0
                                                ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,101E      ;1861    TRPH1:   RC[0D]_SC
U 101E, 0000,003D,D980,0800,0084,7249      ;1862    =0       SETRCF[.9]
U 101F, 0000,003C,49F0,2C00,0000,1057      ;1863             Q_ID[TBER0]
U 1057, 0001,203C,4DF0,2DB0,0000,105B      ;1864             RC[6]_Q,Q_ID[TBER1]
U 105B, 0001,203C,65F0,2DB8,0000,105F      ;1865             RC[7]_Q,Q_ID[SBI.ERR]
U 105F, 0001,203C,6DF0,2DD8,0000,1109      ;1866             RC[0B]_Q,Q_ID[FAULT]
U 1109, 0001,203C,75F0,2DE0,0000,1154      ;1867             RC[0C]_Q,Q_ID[MAINT]
U 1154, 0001,203C,79F0,2DC8,0000,122D      ;1868             RC[9]_Q,Q_ID[PARITY]
U 122D, 0001,203C,69F0,2DC0,0000,122E      ;1869             RC[8]_Q,Q_ID[TIME.ADDR]
U 122E, 0001,203C,81F0,2DD0,0000,1000      ;1870             RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1243      ;1871    1000:    RC[0E]_Q,ERROR1
                                           ;1872    ;+
                                           ;1873    ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                           ;1874    ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                           ;1875    ;                  NEWTST
                                           ;1876    ;                  ERLOOP
                                           ;1877    ;                  ERROR1
                                           ;1878    ;                  ERROR2
                                           ;1879    ;
U 122F, 0000,003C,65F8,0800,0084,7230      ;1880    SCOPE:   SC_K[.10],Q_0                      ; SETUP TO WRITE IPL OF 1F
U 1230, 0818,0038,8D80,0800,0000,1231      ;1881             D_K[.1F]                           ; ...
U 1231, 0D00,003C,0180,0800,0000,1232      ;1882             D_DAL.SC
U 1232, 0000,003C,3D80,3C00,0000,1233      ;1883             ID[PSL]_D                          ; WRITE THE PSL
U 1233, 0818,0038,0580,0800,0000,1234      ;1884             D_K[.1]                            ; SETUP TO CLEAR THE CES REGISTER
U 1234, 0D00,003C,0180,0800,0000,1235      ;1885             D_DAL.SC
U 1235, 0F00,003C,3180,3C00,0000,1236      ;1886             ID[CES]_D,D_0                      ; CLEAR THE CES REGISTER
U 1236, 0000,003C,5D80,3C00,0000,1237      ;1887             ID[ACC.CS]_D                       ; SHUT OFF THE FLOATING POINT
U 1237, 0000,003C,3980,3C00,0000,1238      ;1888             ID[SIR]_D                          ; CLEAR THE SIR REGISTER
U 1238, 0000,003C,2980,3C00,0000,1239      ;1889             ID[CLK.CS]_D                       ; STOP INTERVAL TIMER
U 1239, 0000,003C,4980,3C00,0000,123A      ;1890             ID[TBER0]_D                        ; SHUT OFF THE TB
U 123A, 0818,0038,[illegible],0800,0000,123B      ;1891             D_K[.FFFF]
U 123B, 0000,003C,6580,3C00,0000,123C      ;1892             ID[SBI.ERR]_D
U 123C, 0F00,003C,6D80,3C00,0000,123D      ;1893             ID[FAULT]_D,D_0
U 123D, 0000,003C,6D80,3C00,0000,123E      ;1894             ID[FAULT]_D
U 123E, 0000,003C,6580,3C00,0000,123F      ;1895             ID[SBI.ERR]_D
U 123F, 0003,003C,0180,09F0,0000,1240      ;1896             RC[0E]_0
U 1240, 0003,003C,0180,0AF8,0000,1241      ;1897             R[0F]_0
U 1241, 0003,003C,0180,09E8,0000,105E      ;1898             RC[0D]_0,J/CALLCON                 ; CALL THE CONSOLE
U 1242, 0818,0038,0980,0800,0000,105E      ;1899    ERLOOP:  D_K[.2],J/CALLCON                  ; ERRLOOP CALL
U 1243, 0810,0038,0180,0978,0000,1244      ;1900    ERROR1:  D_RC[0F]
U 1244, 0819,0034,4D80,0800,0000,104E      ;1901             D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E      ;1902    104E:    D_D.OR.K[.4],J/CALLCON
U 1245, 0810,0038,0180,0978,0000,1246      ;1903    ERROR2:  D_RC[0F]
U 1246, 0819,0034,4D80,0800,0000,105A      ;1904             D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E      ;1905    105A:    D_D.OR.K[.6],J/CALLCON
                                           ;1906    105E:
                                           ;1907    CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E      ;1908             ID[TXDB]_D,J/CALLCON               ; CALL THE CONSOLE
                                           ;1909    ;+
                                           ;1910    ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                           ;1911    ;-
U 13F0, 0000,003C,0180,0800,0000,13F1      ;1912    13F0:    NOP
U 13F1, 0000,003C,0180,0800,0000,13F2      ;1913    13F1:    NOP
U 13F2, 0000,003C,0180,0800,0000,13F3      ;1914    13F2:    NOP
U 13F3, 0000,003C,0180,0800,0000,13F4      ;1915    13F3:    NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5    ;1916    13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6    ;1917    13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7    ;1918    13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8    ;1919    13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9    ;1920    13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA    ;1921    13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB    ;1922    13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC    ;1923    13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD    ;1924    13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE    ;1925    13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF    ;1926    13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155    ;1927    13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA    ;1928    1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,1247    ;1929    12AA:   NOP
                                         ;1930    ;+
                                         ;1931    ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                         ;1932    ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                         ;1933    ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                         ;1934    ; TYPING IT.
                                         ;1935    ;-
U 1247, 0810,0038,4D80,0978,0000,1248    ;1936    SUBTST: D_RC[OF],KMX/.FF00
U 1248, 0019,4016,4D80,09F8,0000,0001    ;1937            RC[OF]_D+K[.FF00],WORD,RETURN1
                                         ;1938    ;+
                                         ;1939    ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                         ;1940    ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                         ;1941    ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                         ;1942    ;-
U 1249, 0010,0038,01C0,0978,0000,124A    ;1943    SETRCF: Q_RC[OF]
U 124A, 0019,2034,4DC0,0800,0000,124B    ;1944            Q_Q.AND.K[.FF00]
U 124B, 0019,2032,1D80,09F8,0000,0001    ;1945            RC[OF]_Q.OR.SC,RETURN1
                                         ;1946    ; THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
                                         ;1947    ; AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
                                         ;1948    ; UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
                                         ;1949    ; ARE LOST.
U 124C, 0F18,0038,C1F8,0800,0000,102A    ;1950    CSOFF:  D_0,Q_0,ALU_K[.FFFF]
U 102A, 0500,003D,0380,0800,0000,1293    ;1951    =0      D_D.LEFT,SI77,CALL,J/DC9
U 102B, 0000,003C,8580,0800,0084,724D    ;1952            SC_K[.C]
U 124D, 0D00,003C,0180,0800,0000,124E    ;1953            D_DAL.SC
U 124E, 0000,003E,7580,3C00,0000,0001    ;1954            ID[MAINT]_D,RETURN1
                                         ;1955    ; THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
                                         ;1956    ; BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.
U 124F, 0818,0038,0DF8,0800,0000,1250    ;1957    COFF:   D_K[.3],Q_0
U 1250, 0000,003C,6180,0800,0084,7251    ;1958            SC_K[.F]
U 1251, 0D00,003C,0180,0800,0000,1252    ;1959            D_DAL.SC
U 1252, 0000,003E,7580,3C00,0000,0001    ;1960            ID[MAINT]_D,RETURN1
                                         ;1961    ; THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
                                         ;1962    ; APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.
U 1253, 0000,003C,8580,0800,0084,7254    ;1963    SOFF:   SC_K[.C]
U 1254, 0803,001C,0180,0800,0000,1255    ;1964            ALU_NOT.MASK,D_ALU
U 1255, 0000,003E,7580,3C00,C000,0001    ;1965            ID[MAINT]_D,RETURN1
                                         ;1966    ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                         ;1967    ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                         ;1968    ; CERTAIN TRAPS.
                                         ;1969    =0
U 1046, 0000,003D,0180,0800,0000,1297    ;1970    DC.DE:  CALL,J/DCD
```

```
U 1047, 0000,003C,0180,0800,0000,104C   ;1971           NOP
U 104C, 0000,003D,0180,0800,0000,1298   ;1972   =0      CALL,J/DCE
U 104D, 0000,003E,0180,0800,0000,0001   ;1973           RETURN1
                                        ;1974   ; THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
                                        ;1975   ; IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
                                        ;1976   ; VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
                                        ;1977   ; MME WILL BE SET HERE. UPON RETURN THE CONTENTS
                                        ;1978   ; OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
                                        ;1979   ; D AND Q ARE LOST.
                                        ;1980   ; THIS ROUTINE WRITES GROUP 1
                                        ;1981   =0
U 1058, 0F00,003D,0180,0800,0000,1292   ;1982   TBWR1:  D_0,CALL,J/DC8
U 1059, 0100,003C,0180,0800,0000,105C   ;1983   TBWR:   D_D.LEFT2,SI/ZERO
U 105C, 0100,003D,0180,0800,0000,128A   ;1984   =0      D_D.LEFT2,SI/ZERO,CALL,J/DC0
U 105D, 0100,003C,0180,0800,0000,1070   ;1985           D_D.LEFT2,SI/ZERO
U 1070, 0100,003D,0180,0800,0000,128B   ;1986   =0      D_D.LEFT2,SI/ZERO,CALL,J/DC1
U 1071, 0800,003C,4980,3E40,0000,1256   ;1987   TBWRA:  ID[TBER0]_D,D_R[8]
U 1256, 0000,003C,4180,3C00,0000,1257   ;1988           ID[TBUF]_D
U 1257, 0000,003E,4DF0,2C00,0000,0001   ;1989           Q_ID[TBER1],RETURN1
                                        ;1990   ; ROUTINE TO WRITE GROUP 0
                                        ;1991   =0
U 1072, 0F00,003D,0180,0800,0000,128E   ;1992   TBWR0:  D_0,CALL,J/DC4
U 1073, 0000,003C,0180,0800,0000,1059   ;1993           J/TBWR
                                        ;1994   ; ROUTINE TO WRITE BOTH GROUP 0 AND 1
                                        ;1995   =0
U 1074, 0F00,003D,0180,0800,0000,1292   ;1996   TBWRB:  D_0,CALL,J/DC8
U 1075, 0500,003C,0180,0800,0000,1059   ;1997           D_D.LEFT,SI/ZERO,J/TBWR
                                        ;1998   ; THIS ROUTINE WRITES THE TB RANDOMLY.
U 1258, 0818,0038,0580,0800,0000,1071   ;1999   TBWRAN: D_K[.1],J/TBWRA
                                        ;2000   ; THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
                                        ;2001   ; THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
                                        ;2002   ; R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
                                        ;2003   ; TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
                                        ;2004   ; R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
                                        ;2005   =0
U 1076, 0800,003D,0180,0A30,0000,128A   ;2006   RELSUB: D_R[6],CALL,J/DC0
U 1077, 0500,003C,D980,0A28,0084,7078   ;2007           D_D.LEFT,SI/ZERO,SC_K[.9],LAB_R[5]
U 1078, 0003,0011,01C0,0800,0000,128A   ;2008   =0      A[U_MASK+1,Q_ALU,CALL,J/DC0
U 1079, 001C,0024,01C0,0800,0000,1259   ;2009           ALU_LA[ANDNOT]Q,Q_ALU
U 1259, 081D,0030,0180,0800,0000,125A   ;2010           ALU_D[OR]Q,D_ALU
U 125A, 0200,003C,0180,0800,0000,125B   ;2011           D_D.RIGHT2,SI/ZERO
U 125B, 0001,003E,0180,0AB8,0000,0001   ;2012           R[7]_D,RETURN1
                                        ;2013   ; THIS SUBROUTINE IS CALLED TO RELOCATE THE VA, GET THE
                                        ;2014   ; TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
                                        ;2015   ; RETURN3 IF THEY ARE EQUAL; RETURN 2 IF THEY ARE NOT EQUAL;
                                        ;2016   ; AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
                                        ;2017   ; INDICATED IN R[E].
U 125C, 0000,003C,0180,0A70,0000,125D   ;2018   RELCHK: LAB_R[0E]
U 125D, 0000,003C,0180,52F8,0000,125E   ;2019           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERNCE
U 125E, 0800,003C,69F0,2E78,0000,125F   ;2020           Q_ID[TIME.ADDR],D_R[0F]
U 125F, 0018,0038,1980,0AF8,0000,1260   ;2021           A[U_0(K),R[0F]_ALU
U 1260, 0000,003C,0180,0A70,0000,1261   ;2022           LAB_R[0E]
U 1261, 001C,2000,0180,0800,0010,1262   ;2023           ALU_LA[A-B]D,CLK.UBCC            ; SEE IF A TRAP OCCURRED.
U 1262, 0000,013C,0180,0800,0000,107A   ;2024           Z?
U 107A, 0001,003C,0180,09C8,0000,126B   ;2025   =0      RC[9]_D,J/TBTRUE        ; TRAPPED SO RETURN1.
```

```
U 107B, 0000,003C,0180,0800,0000,107C   ;2026           NOP
U 107C, 0F00,003D,0180,0800,0000,1298   ;2027   =0      D_0,CALL,J/DCE                  ; MASK OFF THE UPPER 4 BITS
U 107D, 0500,003C,0180,0800,0000,1263   ;2028           D_D.LEFT,SI/ZERO
U 1263, 0001,003C,0180,0800,0082,1264   ;2029           SC_D
U 1264, 0803,0010,0180,0800,0000,1265   ;2030           ALU_MASK+1,D_ALU
U 1265, 001D,2024,01C0,0800,0000,1266   ;2031           ALU_Q[ANDNOT]D,Q_ALU
U 1266, 0800,003C,0180,0A38,0000,1267   ;2032           D_R[7]                          ; SEE IF ADDRESS RELOCATED
U 1267, 0001,003C,0180,09E0,0000,1268   ;2033           RC[0C]_D
U 1268, 0001,203C,0180,09D8,0000,1269   ;2034           RC[0B]_Q
U 1269, 001D,2000,0180,0800,0010,126A   ;2035           ALU_Q-D,CLK.UBCC                ; PROPERLY.
U 126A, 0000,013C,0180,0800,0000,107E   ;2036           Z?
U 107E, 0000,003E,0180,0800,0000,0002   ;2037   =0      RETURN2                         ; INCORRECT.
U 107F, 0000,003E,0180,0800,0000,0003   ;2038           RETURN3                         ; OK
U 126B, 0000,003C,4DF0,2C00,0000,126C   ;2039   TBTRUE: Q_ID[TBER1]
U 126C, 0001,203E,0180,09F0,0000,0001   ;2040           RC[0E]_Q,RETURN1
                                        ;2041   ; THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
                                        ;2042   ; IF NO TRAP OCCURS WHEN THE REFERNCE IS MADE EXECUTE A RETURN1.
                                        ;2043   ; IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
                                        ;2044   ; A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
U 126D, 0000,003C,0180,0A70,0000,126E   ;2045   MISS:   LAB_R[0E]
U 126E, 0000,003C,0180,52F8,0000,126F   ;2046           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
U 126F, 0800,003C,0180,0A78,0000,1270   ;2047           D_R[0F]
U 1270, 0018,0038,1980,0AF8,0000,1271   ;2048           ALU_0(K),R[0F]_ALU
U 1271, 0000,003C,0180,0A70,0000,1272   ;2049           LAB_R[0E]
U 1272, 0001,003C,0180,09C8,0000,1273   ;2050           RC[9]_D
U 1273, 001C,2000,0180,0800,0010,1274   ;2051           ALU_LA[A-B]D,CLK.UBCC           ; SEE IF A TRAP OCCRRED.
U 1274, 0000,013C,0180,0800,0000,1080   ;2052           Z?
U 1080, 0000,003C,0180,0800,0000,1275   ;2053   =0      J/MISSA
U 1081, 0000,003E,0180,0800,0000,0001   ;2054           RETURN1                         ; NO TRAP SO RETURN1.
U 1275, 0000,003C,D580,0800,0084,7276   ;2055   MISSA:  SC_K[.6]                        ; IF A TRAP OCCURRED SEE
U 1276, 0001,0024,0180,0800,0010,1277   ;2056           ALU_D.ANDNOT.MASK,CLK.UBCC      ; IF IT WAS A TB MISS TRAP.
U 1277, 0000,013C,4DF0,2C00,0000,1082   ;2057           Z?,Q_ID[TBER1]
U 1082, 0001,203E,0180,09F0,0000,0002   ;2058   =0      RETURN2,RC[0E]_Q                ; NOT TB MISS.
U 1083, 0000,003E,0180,0800,0000,0003   ;2059           RETURN3                         ; TB MISS.
                                        ;2060   ; THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
                                        ;2061   ; RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
                                        ;2062   ; TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
                                        ;2063   ; HIT/MISS BIT IN TBER0 IS INCORRECT.
                                        ;2064   ; RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
                                        ;2065   ; CHECK HIT IN GROUP 0.
U 1278, 0000,003C,D580,0A70,0084,7279   ;2066   HIT0:   LAB_R[0E],SC_K[.6]
U 1279, 0000,003C,0180,52F8,0000,127A   ;2067   HIT:    R[0F]_LA,FS/MCT,MCT/READ.V.WCHK         ; NO TRAP IF HIT
U 127A, 0800,003C,49F0,2E78,0000,127B   ;2068           Q_ID[TBER0],D_R[0F]
U 127B, 0018,0038,1980,0AF8,0000,127C   ;2069           ALU_0(K),R[0F]_ALU
U 127C, 0001,203C,0180,09E8,0000,127D   ;2070           RC[0D]_Q
U 127D, 0003,001C,0180,09F0,0000,127E   ;2071           RC[0E]_ALU,ALU_NOT.MASK
U 127E, 0000,003C,0180,0A70,0000,127F   ;2072           LAB_R[0E]
U 127F, 001C,2000,0180,0800,0010,1280   ;2073           ALU_LA[A-B]D,CLK.UBCC                   ; SEE IF TRAP OCCURRED.
U 1280, 0001,013C,0180,09C8,0000,1084   ;2074           Z?,RC[9]_D
U 1084, 0000,003C,0180,0800,0000,1282   ;2075   =0      J/HITA                          ; TRAP OCCURRED.
U 1085, 0001,2024,0180,0800,0010,1281   ;2076           ALU_Q.ANDNOT.MASK,CLK.UBCC      ; NO TRAP BUT IS HIT/MISS BIT SET?
U 1281, 0000,013C,0180,0800,0000,1086   ;2077           Z?
U 1086, 0000,003E,0180,0800,0000,0004   ;2078   =0      RETURN4                         ; SET SO IT WAS A HIT.
U 1087, 0000,003E,0180,0800,0000,0003   ;2079           RETURN3                         ; CLEAR SO REFERENCE WAS A MISS.
U 1282, 0000,003C,D580,0800,0084,7283   ;2080   HITA:   SC_K[.6]                        ; TRAPPED, SO SEE IF TB MISS TRAP.
```

```
U 1283, 0001,0024,0180,0800,0010,1284   ;2081           ALU_D.ANDNOT.MASK,CLK.UBCC
U 1284, 0000,013C,0180,0800,0000,1088   ;2082           Z?
U 1088, 0000,003C,0180,0800,0000,126B   ;2083   =0      J/TBTRUE                         ; NOT TB MISS TRAP.
U 1089, 0000,003E,0180,0800,0000,0002   ;2084           RETURN2                          ; TB MISS TRAP OCCURRED.
                                        ;2085   ; CHECK HIT IN GROUP 1.
U 1285, 0000,003C,5D80,0A70,0084,7279   ;2086   HIT1:   LAB_R[0E],SC_K[.7],J/HIT
                                        ;2087   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 1286, 0118,0038,1B80,0800,0000,129A   ;2088   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 1287, 0118,0038,0B80,0800,0000,129A   ;2089   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1288, 0118,0038,0780,0800,0000,129A   ;2090   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 1289, 0118,0038,C380,0800,0000,129A   ;2091   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 128A, 0018,0038,1980,0800,0000,1286   ;2092   DC0:    ALU_0(K),J/S00
U 128B, 0018,0038,1980,0800,0000,1287   ;2093   DC1:    ALU_0(K),J/S01
U 128C, 0018,0038,1980,0800,0000,1288   ;2094   DC2:    ALU_0(K),J/S10
U 128D, 0018,0038,1980,0800,0000,1289   ;2095   DC3:    ALU_0(K),J/S11
U 128E, 0018,0038,0980,0800,0000,1286   ;2096   DC4:    ALU_K[.2],J/S00
U 128F, 0018,0038,0980,0800,0000,1287   ;2097   DC5:    ALU_K[.2],J/S01
U 1290, 0018,0038,0980,0800,0000,1288   ;2098   DC6:    ALU_K[.2],J/S10
U 1291, 0018,0038,0980,0800,0000,1289   ;2099   DC7:    ALU_K[.2],J/S11
U 1292, 0018,0038,0580,0800,0000,1286   ;2100   DC8:    ALU_K[.1],J/S00
U 1293, 0018,0038,0580,0800,0000,1287   ;2101   DC9:    ALU_K[.1],J/S01
U 1294, 0018,0038,0580,0800,0000,1288   ;2102   DCA:    ALU_K[.1],J/S10
U 1295, 0018,0038,0580,0800,0000,1289   ;2103   DCB:    ALU_K[.1],J/S11
U 1296, 0018,0038,C180,0800,0000,1286   ;2104   DCC:    ALU_K[.FFFF],J/S00
U 1297, 0018,0038,C180,0800,0000,1287   ;2105   DCD:    ALU_K[.FFFF],J/S01
U 1298, 0018,0038,C180,0800,0000,1288   ;2106   DCE:    ALU_K[.FFFF],J/S10
U 1299, 0018,0038,C180,0800,0000,1289   ;2107   DCF:    ALU_K[.FFFF],J/S11
U 129A, 0100,003E,0380,0800,0000,0001   ;2108   SX:     D_D.LEFT2,SI/7,RETURN1
U 129B, 0018,0038,01C0,0800,0000,108A   ;2109   DC.5:   Q_K[.8]
                                        ;2110   =0
U 108A, 0000,003D,0180,0800,0000,128F   ;2111   DC.5A:  CALL,J/DC5
U 108B, 0019,2000,05C0,0800,0010,129C   ;2112           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 129C, 0000,013C,0180,0800,0000,108C   ;2113           Z?
U 108C, 0000,003C,0180,0800,0000,108A   ;2114   =0      J/DC.5A
U 108D, 0000,003E,0180,0800,0000,0001   ;2115           RETURN1
                                        ;2116   =0
U 108E, 0000,003D,0180,0800,0000,129B   ;2117   DC.A:   CALL,J/DC.5
U 108F, 0500,003E,0180,0800,0000,0001   ;2118           D_D.LEFT,SI/ZERO,RETURN1
U 129D, 0018,0038,01C0,0800,0000,1090   ;2119   DC.9:   Q_K[.8]
                                        ;2120   =0
U 1090, 0000,003D,0180,0800,0000,1293   ;2121   DC.9A:  CALL,J/DC9
U 1091, 0019,2000,05C0,0800,0010,129E   ;2122           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 129E, 0000,013C,0180,0800,0000,1092   ;2123           Z?
U 1092, 0000,003C,0180,0800,0000,1090   ;2124   =0      J/DC.9A
U 1093, 0000,003E,0180,0800,0000,0001   ;2125           RETURN1
                                        ;2126   =0
U 1094, 0000,003D,0180,0800,0000,129D   ;2127   DC.C:   CALL,J/DC.9
U 1095, 0018,0038,C180,0800,0000,129F   ;2128           ALU_K[.FFFF]
U 129F, 0600,003E,0380,0800,0000,0001   ;2129           D_D.RIGHT,SI/7,RETURN1
                                        ;2130   =0
U 1096, 0000,003D,0180,0800,0000,129D   ;2131   DC.6:   CALL,J/DC.9
U 1097, 0018,0038,0580,0800,0000,12A0   ;2132           ALU_K[.1]
U 12A0, 0100,003E,0380,0800,0000,0001   ;2133           D_D.LEFT2,SI/7,RETURN1
                                        ;2134   =0
U 1098, 0000,003D,0180,0800,0000,129D   ;2135   DC.3:   CALL,J/DC.9
```

```
U 1099, 0018,0038,0180,0800,0000,12A1    ;2136                ALU_K[.FFFF]
U 12A1, 0500,003E,0380,0800,0000,0001    ;2137                D_D.LEFT,SI/7,RETURN1
                                         ;2138    ; THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
                                         ;2139    ; A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
                                         ;2140    ; SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
                                         ;2141    ; FOLLOWING DATA PATTERNS:
                                         ;2142    ;
                                         ;2143    ;           R[0B]           7FFFC000
                                         ;2144    ;           R[0C]           A4000000
                                         ;2145    ;           R[0D]           001FFFFF
                                         ;2146    ;
                                         ;2147    ;           RC[0]           A4155555
                                         ;2148    ;           RC[1]           4CCCC000
                                         ;2149    ;           RC[2]           0AAAAA80
                                         ;2150    ;
                                         ;2151    ;           RC[3]           A4199999
                                         ;2152    ;           RC[4]           55554000
                                         ;2153    ;           RC[5]           0CCCCC80
                                         ;2154    ;
                                         ;2155    ;           RC[6]           A40AAAAA
                                         ;2156    ;           RC[7]           33330000
                                         ;2157    ;           RC[8]           05555500
                                         ;2158    ;
                                         ;2159    ;           R[0]            A4066666
                                         ;2160    ;           R[1]            2AAA8000
                                         ;2161    ;           R[2]            03333300
                                         ;2162    ;
U 12A2, 0F18,0038,0580,0800,0000,12A3    ;2163    TBWPTP: D_0,ALU_K[.1]
U 12A3, 0218,0038,0B80,0800,0000,12A4    ;2164            D_D.RIGHT2,SI/7,ALU_K[.2]
U 12A4, 0218,0038,0B80,0800,0000,12A5    ;2165            D_D.RIGHT2,SI/7,ALU_K[.2]
U 12A5, 0200,003C,0380,0800,0000,12A6    ;2166            D_D.RIGHT2,SI/7
U 12A6, 0001,003C,0180,0AE0,0000,12A7    ;2167            R[0C]_D
U 12A7, 0000,003C,6180,0800,0084,72A8    ;2168            SC_K[.F]
U 12A8, 0043,0010,0180,0AD8,0000,12A9    ;2169            ALU_MASK+1,R[0B]_ALU.RIGHT,SI/ZERO
U 12A9, 081B,0000,0580,0800,0000,12AB    ;2170            D_0-K[.1]
U 12AB, 0018,0038,21C0,0800,0000,12AC    ;2171            Q_K[.14]
U 12AC, 0019,2014,0580,0800,0082,12AD    ;2172            ALU_Q+K[.1],SC_ALU
U 12AD, 0003,001C,01C0,0800,0000,12AE    ;2173            ALU_NOT.MASK,Q_ALU
U 12AE, 001D,2014,0180,0AE8,0000,109A    ;2174            ALU_Q[A+B]D,R[0D]_ALU
U 109A, 0000,003D,0180,0800,0000,129B    ;2175    =0      CALL,J/DC.5
U 109B, 0000,003C,0180,0A68,0000,12AF    ;2176            LAB_R[0D]
U 12AF, 081C,2034,0180,0800,0000,12B0    ;2177            ALU_LA[AND]D,D_ALU
U 12B0, 081C,2030,0180,0A60,0000,12B1    ;2178            LAB_R[0C],ALU_[A[OR]D,D_ALU
U 12B1, 0001,003C,0180,0980,0000,109C    ;2179            RC[0]_D
U 109C, 0001,003D,0180,0AB0,0000,1094    ;2180    =0      R[6]_D,CALL,J/DC.C
U 109D, 0000,003C,0180,0A58,0000,12B2    ;2181            LAB_R[0B]
U 12B2, 081C,2034,0180,0988,0000,109E    ;2182            ALU_LA[AND]D,D_ALU,RC[1]_ALU
U 109E, 0001,003D,0180,0AA8,0000,1076    ;2183    =0      R[5]_D,CALL,J/RELSUB
U 109F, 0001,003C,0180,0990,0000,10A0    ;2184            RC[2]_D
U 10A0, 0000,003D,0180,0800,0000,129D    ;2185    =0      CALL,J/DC.9
U 10A1, 0000,003C,0180,0A68,0000,12B3    ;2186            LAB_R[0D]
U 12B3, 081C,2034,0180,0800,0000,12B4    ;2187            ALU_LA[AND]D,D_ALU
U 12B4, 081C,2030,0180,0A60,0000,12B5    ;2188            LAB_R[0C],ALU_[A[OR]D,D_ALU
U 12B5, 0001,003C,0180,0998,0000,10A2    ;2189            RC[3]_D
U 10A2, 0001,003D,0180,0AB0,0000,129B    ;2190    =0      R[6]_D,CALL,J/DC.5
```

```
U 10A3, 0000,003C,0180,0A58,0000,12B6   ;2191           LAB_R[0B]
U 12B6, 081C,2034,0180,09A0,0000,10A4   ;2192           ALU_LA[AND]D,D_ALU,RC[4]_ALU
U 10A4, 0001,003D,0180,0AA8,0000,1076   ;2193   =0      R[5]_D,CALL,J/RELSUB
U 10A5, 0001,003C,0180,09A8,0000,10A6   ;2194           RC[5]_D
U 10A6, 0000,003D,0180,0800,0000,108E   ;2195   =0      CALL,J/DC.A
U 10A7, 0000,003C,0180,0A68,0000,12B7   ;2196           LAB_R[0D]
U 12B7, 081C,2034,0180,0800,0000,12B8   ;2197           ALU_LA[AND]D,D_ALU
U 12B8, 081C,2030,0180,0A60,0000,12B9   ;2198           LAB_R[0C],ALU_[A[OR]D,D_ALU
U 12B9, 0001,003C,0180,09B0,0000,10A8   ;2199           RC[6]_D
U 10A8, 0001,003D,0180,0AB0,0000,1098   ;2200   =0      R[6]_D,CALL,J/DC.3
U 10A9, 0000,003C,0180,0A58,0000,12BA   ;2201           LAB_R[0B]
U 12BA, 081C,2034,0180,09B8,0000,10AA   ;2202           ALU_LA[AND]D,D_ALU,RC[7]_ALU
U 10AA, 0001,003D,0180,0AA8,0000,1076   ;2203   =0      R[5]_D,CALL,J/RELSUB
U 10AB, 0001,003C,0180,09C0,0000,10AC   ;2204           RC[8]_D
U 10AC, 0000,003D,0180,0800,0000,1096   ;2205   =0      CALL,J/DC.6
U 10AD, 0000,003C,0180,0A68,0000,12BB   ;2206           LAB_R[0D]
U 12BB, 081C,2034,0180,0800,0000,12BC   ;2207           ALU_LA[AND]D,D_ALU
U 12BC, 081C,2030,0180,0A60,0000,12BD   ;2208           LAB_R[0C],ALU_[A[OR]D,D_ALU
U 12BD, 0001,003C,0180,0A80,0000,10AE   ;2209           R[0]_D
U 10AE, 0001,003D,0180,0AB0,0000,108E   ;2210   =0      R[6]_D,CALL,J/DC.A
U 10AF, 0000,003C,0180,0A58,0000,12BE   ;2211           LAB_R[0B]
U 12BE, 081C,2034,0180,0A88,0000,10B0   ;2212           ALU_LA[AND]D,D_ALU,R[1]_ALU
U 10B0, 0001,003D,0180,0AA8,0000,1076   ;2213   =0      R[5]_D,CALL,J/RELSUB
U 10B1, 0001,003E,0180,0A90,0000,0001   ;2214           R[2]_D,RETURN1
                                        ;2215   ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE FXECUTED
                                        ;2216   ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
                                        ;2217   ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 12BF, 0000,003F,0180,0800,0000,117C   ;2218   TARGC3: SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001   ;2219   117C:   RETURN1
U 117D, 0000,003E,0180,0800,0000,0002   ;2220   117D:   RETURN2
U 117E, 0000,003E,0180,0800,0000,0003   ;2221   117E:   RETURN3
U 117F, 0000,003E,0180,0800,0000,0004   ;2222   117F:   RETURN4
U 11FC, 0000,003D,0180,0800,0000,1243   ;2223   11FC:   ERROR1
U 11FD, 0000,003D,0180,0800,0000,1243   ;2224   11FD:   ERROR1
U 11FE, 0000,003D,0180,0800,0000,1243   ;2225   11FE:   ERROR1
U 11FF, 0000,003D,0180,0800,0000,1243   ;2226   11FF:   ERROR1
                                        ;2227   ; THIS TABLE IS USED TO TEST MCT FUNCTIONS WHICH ENABLE
                                        ;2228   ; TB MISS UTRAPS
                                        ;2229   =000
U 1008, 0000,003E,0180,2AF8,0000,0001   ;2230   TBTAB0: R[0F]_LA,FS/MCT,MCT/WRITE.V.NOCHK,RETURN1
U 1009, 0000,003E,0180,32F8,0000,0001   ;2231           R[0F]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
U 100A, 0000,003E,0180,42F8,0000,0001   ;2232           R[0F]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
U 100B, 0000,003E,0180,4AF8,0000,0001   ;2233           R[0F]_LA,FS/MCT,MCT/READ.V.NOCHK,RETURN1
U 100C, 0000,003E,0180,52F8,0000,0001   ;2234           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
U 100D, 0000,003E,0180,5AF8,0000,0001   ;2235           R[0F]_LA,FS/MCT,MCT/READ.V.IBCHK,RETURN1
U 100E, 0000,003E,0180,6AF8,0000,0001   ;2236           R[0F]_LA,FS/MCT,MCT/LOCKREAD.V.NOCHK,RETURN1
U 100F, 0000,003E,0180,72F8,0000,0001   ;2237           R[0F]_LA,FS/MCT,MCT/LOCKREAD.V.WCHK,RETURN1
                                        ;2238   ; THIS TABLE IS USED TO TEST MCT FUNCTIONS WHICH DISABLE
                                        ;2239   ; TB MISS UTRAPS.
                                        ;2240   =00
U 1004, 0000,003E,0180,02F8,0000,0001   ;2241   TBTAB1: R[0F]_LA,FS/MCT,MCT/TEST.RCHK,RETURN1
U 1005, 0000,003E,0180,0AF8,0000,0001   ;2242           R[0F]_LA,FS/MCT,MCT/MEM.NOP,RETURN1
U 1006, 0000,003E,0180,12F8,0000,0001   ;2243           R[0F]_LA,FS/MCT,MCT/TEST.WCHK,RETURN1
U 1007, 0000,003E,0180,62F8,0000,0001   ;2244           R[0F]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1
                                        ;2245   ; THIS TABLE IS USED TO TEST MCT FUNCTIONS WHICH DISABLE
```

```
                                                ;2246   ; UTRAPS CAUSED BY:
                                                ;2247   ; TB MISS, ACCESS VIOLATION, XPAGE, ALLIGNMENT, MODIFY BIT AND
                                                ;2248   ; TB PARITY ERRORS.
                                                ;2249   =0000
U 1010, 0000,003E,0180,82F8,0000,0001           ;2250   TBTAB2: R[OF]_LA,FS/MCT,MCT/SBI.HOLD,RETURN1
U 1011, 0000,003E,0180,8AF8,0000,0001           ;2251           R[OF]_LA,FS/MCT,MCT/SBI.HOLD+UNJAM,RETURN1
U 1012, 0000,003E,0180,92F8,0000,0001           ;2252           R[OF]_LA,FS/MCT,MCT/INVALIDATE,RETURN1
U 1013, 0000,003E,0180,9AF8,0000,0001           ;2253           R[OF]_LA,FS/MCT,MCT/VALIDATE,RETURN1
U 1014, 0000,003E,0180,A2F8,0000,0001           ;2254           R[OF]_LA,FS/MCT,MCT/EXTWRITE.P,RETURN1
U 1015, 0000,003E,0180,AAF8,0000,0001           ;2255           R[OF]_LA,FS/MCT,MCT/WRITE.P,RETURN1
U 1016, 0000,003E,0180,BAF8,0000,0001           ;2256           R[OF]_LA,FS/MCT,MCT/LOCKWRITE.P,RETURN1
U 1017, 0000,003E,0180,CAF8,0000,0001           ;2257           R[OF]_LA,FS/MCT,MCT/READ.P,RETURN1
U 1018, 0000,003E,0180,DAF8,0000,0001           ;2258           R[OF]_LA,FS/MCT,MCT/READ.INT.SUM,RETURN1
U 1019, 0000,003E,0180,EAF8,0000,0001           ;2259           R[OF]_LA,FS/MCT,MCT/LOCKREAD.P,RETURN1
U 101A, 0000,003E,0180,FAF8,0000,0001           ;2260           R[OF]_LA,FS/MCT,MCT/ALLOW.IB.READ,RETURN1
U 101B, 0000,003E,0180,5EF8,0000,0001           ;2261           R[OF]_LA,MCT/17,RETURN1
U 101C, 0000,003E,0180,DEF8,0000,0001           ;2262           R[OF]_LA,MCT/37,RETURN1
                                                ;2263   =
                                                ;2264   ; THIS IS A TABLE OF MCT FUNCTION WHICH WILL ENABLE
                                                ;2265   ; READ OR WRITE ACCESS VIOLATIONS IN THE TB.
                                                ;2266   =000
U 1040, 0000,003E,0180,32F8,0000,0001           ;2267   TBTAB3: R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
U 1041, 0000,003E,0180,42F8,0000,0001           ;2268           R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
U 1042, 0000,003E,0180,52F8,0000,0001           ;2269           R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
U 1043, 0000,003E,0180,5AF8,0000,0001           ;2270           R[OF]_LA,FS/MCT,MCT/READ.V.IBCHK,RETURN1
U 1044, 0000,003E,0180,72F8,0000,0001           ;2271           R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.WCHK,RETURN1
                                                ;2272   =
                                                ;2273   ; THIS IS A TABLE FOR TESTING MCT FUNCTIONS THAT DISABLE ACCESS
                                                ;2274   ; VIOLATION CHECKS WITH ACCESS CODES WHICH ALLOW NO ACCESS.
                                                ;2275   =000
U 1050, 0000,003E,0180,02F8,0000,0001           ;2276   TBTAB4: R[OF]_LA,FS/MCT,MCT/TEST.RCHK,RETURN1
U 1051, 0000,003E,0180,0AF8,0000,0001           ;2277           R[OF]_LA,FS/MCT,MCT/MEM.NOP,RETURN1
U 1052, 0000,003E,0180,12F8,0000,0001           ;2278           R[OF]_LA,FS/MCT,MCT/TEST.WCHK,RETURN1
U 1053, 0000,003E,0180,2AF8,0000,0001           ;2279           R[OF]_LA,FS/MCT,MCT/WRITE.V.NOCHK,RETURN1
U 1054, 0000,003E,0180,4AF8,0000,0001           ;2280           R[OF]_LA,FS/MCT,MCT/READ.V.NOCHK,RETURN1
U 1055, 0000,003E,0180,62F8,0000,0001           ;2281           R[OF]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1
U 1056, 0000,003E,0180,6AF8,0000,0001           ;2282           R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.NOCHK,RETURN1
                                                ;2283   =
                                                ;2284   ; THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH ENABLE UTRAPS
                                                ;2285   ; ON ACCESS VIOLATIONS WHEN THE ACCESS CODE ALLOWS FOR
                                                ;2286   ; READ ONLY ACCESS.
                                                ;2287   =00
U 102C, 0000,003E,0180,32F8,0000,0001           ;2288   TBTAB5: R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
U 102D, 0000,003E,0180,52F8,0000,0001           ;2289           R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
U 102E, 0000,003E,0180,72F8,0000,0001           ;2290           R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.WCHK,RETURN1
                                                ;2291   =
                                                ;2292   ; THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH DISABLE
                                                ;2293   ; ACCESS VIOLATION TRAPS WITH ACCESS CODES ALLOWING READ ONLY.
                                                ;2294   =000
U 1060, 0000,003E,0180,02F8,0000,0001           ;2295   TBTAB6: R[OF]_LA,FS/MCT,MCT/TEST.RCHK,RETURN1
U 1061, 0000,003E,0180,0AF8,0000,0001           ;2296           R[OF]_LA,FS/MCT,MCT/MEM.NOP,RETURN1
U 1062, 0000,003E,0180,12F8,0000,0001           ;2297           R[OF]_LA,FS/MCT,MCT/TEST.WCHK,RETURN1
U 1063, 0000,003E,0180,2AF8,0000,0001           ;2298           R[OF]_LA,FS/MCT,MCT/WRITE.V.NOCHK,RETURN1
U 1064, 0000,003E,0180,42F8,0000,0001           ;2299           R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
U 1065, 0000,003E,0180,4AF8,0000,0001           ;2300           R[OF]_LA,FS/MCT,MCT/READ.V.NOCHK,RETURN1
```

```
U 1066, 0000,003E,0180,62F8,0000,0001    ;2301           R[OF]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1
U 1067, 0000,003E,0180,6AF8,0000,0001    ;2302           R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.NOCHK,RETURN1
                                         ;2303   =
                                         ;2304   ; THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH ENABLE MODIFY
                                         ;2305   ; BIT UTRAPS.
                                         ;2306   =00
U 103C, 0000,003E,0180,32F8,0000,0001    ;2307   TBTAB7: R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
U 103D, 0000,003E,0180,52F8,0000,0001    ;2308           R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
U 103E, 0000,003E,0180,72F8,0000,0001    ;2309           R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.WCHK,RETURN1
                                         ;2310   =
                                         ;2311   ; THIS IS A TABLE USED TEST MCT FUNCTIONS WHICH DISABLE TB
                                         ;2312   ; MODIFY BIT UTRAPS.
                                         ;2313   =000
U 1068, 0000,003E,0180,02F8,0000,0001    ;2314   TBTAB8: R[OF]_LA,FS/MCT,MCT/TEST.RCHK,RETURN1
U 1069, 0000,003E,0180,0AF8,0000,0001    ;2315           R[OF]_LA,FS/MCT,MCT/MEM.NOP,RETURN1
U 106A, 0000,003E,0180,12F8,0000,0001    ;2316           R[OF]_LA,FS/MCT,MCT/TEST.WCHK,RETURN1
U 106B, 0000,003E,0180,2AF8,0000,0001    ;2317           R[OF]_LA,FS/MCT,MCT/WRITE.V.NOCHK,RETURN1
U 106C, 0000,003E,0180,42F8,0000,0001    ;2318           R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
U 106D, 0000,003E,0180,4AF8,0000,0001    ;2319           R[OF]_LA,FS/MCT,MCT/READ.V.NOCHK,RETURN1
U 106E, 0000,003E,0180,62F8,0000,0001    ;2320           R[OF]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1
U 106F, 0000,003E,0180,6AF8,0000,0001    ;2321           R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.NOCHK,RETURN1
                                         ;2322   ; THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH ENABLE
                                         ;2323   ; ALLIGNMENT AND XPAGE ERROR1
                                         ;2324   =00
U 1048, 0000,003E,0180,32F8,0000,0001    ;2325   TBTAB9: R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
U 1049, 0000,003E,0180,42F8,0000,0001    ;2326           R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
U 104A, 0000,003E,0180,52F8,0000,0001    ;2327           R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
U 104B, 0000,003E,0180,5AF8,0000,0001    ;2328           R[OF]_LA,FS/MCT,MCT/READ.V.IBCHK,RETURN1
                                         ;2329   ; THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH DISABLE
                                         ;2330   ; UTRAPS ON ALLIGNMENT ERRORS AND XPAGE ERRORS.
                                         ;2331   =0000
U 1020, 0000,003E,0180,02F8,0000,0001    ;2332   TBTABA: R[OF]_LA,FS/MCT,MCT/TEST.RCHK,MSC/NOP,RETURN1
U 1021, 0000,003E,0180,0AF8,0000,0001    ;2333           R[OF]_LA,FS/MCT,MCT/MEM.NOP,MSC/NOP,RETURN1
U 1022, 0000,003E,0180,12F8,0000,0001    ;2334           R[OF]_LA,FS/MCT,MCT/TEST.WCHK,MSC/NOP,RETURN1
U 1023, 0000,003E,0180,32F8,3000,0001    ;2335           R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,MSC/SECOND.REF,RETURN1
U 1024, 0000,003E,0180,32F8,3400,0001    ;2336           R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,MSC/RETRY.NO.TRAP,RETURN1
U 1025, 0000,003E,0180,42F8,3000,0001    ;2337           R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,MSC/SECOND.REF,RETURN1
U 1026, 0000,003E,0180,42F8,3400,0001    ;2338           R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,MSC/RETRY.NO.TRAP,RETURN1
U 1027, 0000,003E,0180,52F8,3000,0001    ;2339           R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,MSC/SECOND.REF,RETURN1
U 1028, 0000,003E,0180,52F8,3400,0001    ;2340           R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,MSC/RETRY.NO.TRAP,RETURN1
U 1029, 0000,003E,0180,62F8,0000,0001    ;2341           R[OF]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1
                                         ;2342   =
                                         ;2343   ; THIS IS A TABLE USED TO TEST MCT FUNCTIONS WHICH ENABLE
                                         ;2344   ; TB PARITY ERROR UTRAPS.
                                         ;2345   =0000
U 1030, 0000,003E,0180,02F8,0000,0001    ;2346   TBTABB: R[OF]_LA,FS/MCT,MCT/TEST.RCHK,RETURN1
U 1031, 0000,003E,0180,12F8,0000,0001    ;2347           R[OF]_LA,FS/MCT,MCT/TEST.WCHK,RETURN1
U 1032, 0000,003E,0180,2AF8,0000,0001    ;2348           R[OF]_LA,FS/MCT,MCT/WRITE.V.NOCHK,RETURN1
U 1033, 0000,003E,0180,32F8,0000,0001    ;2349           R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK,RETURN1
U 1034, 0000,003E,0180,3AF8,0000,0001    ;2350           R[OF]_LA,FS/MCT,MCT/LOCKWRITE.V.XCHK,RETURN1
U 1035, 0000,003E,0180,42F8,0000,0001    ;2351           R[OF]_LA,FS/MCT,MCT/READ.V.RCHK,RETURN1
U 1036, 0000,003E,0180,4AF8,0000,0001    ;2352           R[OF]_LA,FS/MCT,MCT/READ.V.NOCHK,RETURN1
U 1037, 0000,003E,0180,52F8,0000,0001    ;2353           R[OF]_LA,FS/MCT,MCT/READ.V.WCHK,RETURN1
U 1038, 0000,003E,0180,5AF8,0000,0001    ;2354           R[OF]_LA,FS/MCT,MCT/READ.V.IBCHK,RETURN1
U 1039, 0000,003E,0180,6AF8,0000,0001    ;2355           R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.NOCHK,RETURN1
```

```
U 103A, 0000,003E,0180,72F8,0000,0001    ;2356          R[OF]_LA,FS/MCT,MCT/LOCKREAD.V.WCHK,RETURN1
                                         ;2357   =
                                         ;2358   ; THIS IS A TABLE WHICH IS USED TO TEST MCT FUNCTIONS WHICH DISABLE
                                         ;2359   ; TB PARITY ERROR UTRAPS.
                                         ;2360   =0
U 10B2, 0000,003E,0180,0AF8,0000,0001    ;2361   TBTABC: R[OF]_LA,FS/MCT,MCT/MEM.NOP,RETURN1
U 10B3, 0000,003E,0180,62F8,0000,0001    ;2362          R[OF]_LA,FS/MCT,MCT/READ.V.NEWPC,RETURN1
                                         ;2363
                                         ;2364          .PAGE   "TEST BE        ODD ADDRESS UTRAP TEST 1"
                                         ;2365   ;***********************************************************************
                                         ;2366   ;++
                                         ;2367   ; TEST  BE      ODD ADDRESS UTRAP TEST 1
                                         ;2368   ;
                                         ;2369   ; TEST DESCRIPTION
                                         ;2370   ;       THIS IS A TEST OF ODD ADDRESS UTRAPS
                                         ;2371   ;       USING CONDITIONS WHICH SHOULD RESULT IN ODD ADDRESS UTRAPS.
                                         ;2372   ;       CONDITIONS TESTED ARE:
                                         ;2373   ;               SUBTEST 1       VA=1,DT/BYTE,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK
                                         ;2374   ;               SUBTEST 2       VA=1,DT/WORD,MSC/NOP,MCT/READ.V.WCHK
                                         ;2375   ;
                                         ;2376   ; ERROR DESCRIPTION
                                         ;2377   ;       UTRAP FLAG
                                         ;2378   ;--
                                         ;2379   ;**********************************************************************
                                         ;2380   =0
|U 10B4, 0000,003D,0180,0800,0000,122F   ;2381   ODDA:   NEWTST
|U 10B5, 0F18,0038,0580,09F8,0000,10B6   ;2382           RC[0F]_K[.1],D_0
|U 10B6, 0000,003D,4980,3C00,0000,124C   ;2383   =0      ID[TBER0]_D,CALL,J/CSOFF
|U 10B7, 0000,003C,8D80,0800,0084,72C0   ;2384           SC_K[.1F]
|U 12C0, 0003,001C,6580,0A80,0084,72C1   ;2385           ALU_NOT.MASK,R[0]_ALU,SC_K[.10]
|U 12C1, 0003,001C,0180,0A88,0000,10B8   ;2386           ALU_NOT.MASK,R[1]_ALU
|U 10B8, 0F00,003D,0180,0800,0000,1046   ;2387   =0      D_0,CALL,J/DC.DE
|U 10B9, 0000,003C,6580,0800,0084,72C2   ;2388           SC_K[.10]
|U 12C2, 0001,001C,0180,0AF0,0000,12C3   ;2389           ALU_D.ORNOT.MASK,R[0E]_ALU
|U 12C3, 0003,003C,0180,0AF8,0000,10BA   ;2390           R[0F]_0
|                                        ;2391   ;//////////////////////////////////////////////////////////////////////
|                                        ;2392   ;+
|                                        ;2393   ; SUBTEST       1
|                                        ;2394   ;       VA=1,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK,DT/BYTE
|                                        ;2395   ;-
|U 10BA, 0000,003D,0180,0800,0000,1247   ;2396   =0      SUBTEST
|U 10BB, 0000,003C,0180,0800,0000,10BC   ;2397           NOP
|U 10BC, 0000,003D,0180,0800,0000,1242   ;2398   =0      ERLOOP
|U 10BD, 0018,0038,0580,0800,0200,12C4   ;2399   ODDA1:  VA_K[.1]
|U 12C4, 0800,003C,0180,0A00,0000,12C5   ;2400           D_R[0]
|U 12C5, 0000,003C,3D80,3C00,0000,12C6   ;2401           ID[PSL]_D
|U 12C6, 0000,003C,0180,1C00,0000,12C7   ;2402           CID/CONT
|U 12C7, 0000,003C,0180,0A70,0000,12C8   ;2403           LAB_R[0E]
|U 12C8, 0000,003C,0180,0AF8,0000,12C9   ;2404           R[0F]_LA
|U 12C9, 0000,803C,0180,5000,0C00,12CA   ;2405           DT/BYTE,MSC/CHK.ODD.ADDR,FS/MCT,MCT/READ.V.WCHK         ; SHOULD UTRAP.
|U 12CA, 0800,003C,0180,0A78,0000,12CB   ;2406           D_R[0F]
|U 12CB, 0003,003C,0180,0AF8,0000,12CC   ;2407           R[0F]_0
|U 12CC, 0001,003C,0180,09F0,0000,12CD   ;2408           RC[0E]_D
|U 12CD, 0000,003C,01C0,0A70,0000,12CE   ;2409           Q_R[0E]
|U 12CE, 001D,2000,0180,0800,0010,12CF   ;2410           ALU_Q-D,CLK.UBCC
|U 12CF, 0000,013C,0180,0800,0000,10BE   ;2411           Z?
|U 10BE, 0C00,003C,0180,0800,0000,12D0   ;2412   =0      J/ODDA2
|U 10BF, 0000,003D,0180,0800,0000,1243   ;2413           ERROR1                  ; NO UTRAP
|U 12D0, 001C,2034,0180,0A08,0010,12D1   ;2414   ODDA2:  LAB_R[1],ALU_LA[AND]D,CLK.UBCC
|U 12D1, 0000,013C,0180,0800,0000,10C0   ;2415           Z?
|U 10C0, 0000,003D,0180,0800,0000,1243   ;2416   =0      ERROR1
|U 10C1, 0000,003C,0180,0800,0000,10C2   ;2417           NOP
                                         ;2418   ;//////////////////////////////////////////////////////////////////////
```

```
                                            ;2419     ;+
                                            ;2420     ; SUBTEST       2
                                            ;2421     ;         VA=1,MSC/NOP,MCT/READ.V.WCHK,DT/WORD
                                            ;2422     ;-
U 10C2, 0000,003D,0180,0800,0000,1247       ;2423     =0        SUBTEST
U 10C3, 0000,003C,0180,0800,0000,10C4       ;2424               NOP
U 10C4, 0000,003D,0180,0800,0000,1242       ;2425     =0        ERLOOP
U 10C5, 0018,0038,0580,0800,0200,12D2       ;2426     ODDA3:    VA_K[.1]
U 12D2, 0800,003C,0180,0A00,0000,12D3       ;2427               D_R[0]
U 12D3, 0000,003C,3D80,3C00,0000,12D4       ;2428               ID[PSL]_D
U 12D4, 0000,003C,0180,1C00,0000,12D5       ;2429               CID/CONT
U 12D5, 0000,003C,0180,0A70,0000,12D6       ;2430               LAB_R[0E]
U 12D6, 0000,003C,0180,0AF8,0000,12D7       ;2431               R[0F]_LA
U 12D7, 0000,403C,0180,5000,0000,12D8       ;2432               DT/WORD,MSC/NOP,FS/MCT,MCT/READ.V.WCHK  ; SHOULD UTRAP
U 12D8, 0800,003C,0180,0A78,0000,12D9       ;2433               D_R[0F]
U 12D9, 0003,003C,0180,0AF8,0000,12DA       ;2434               R[0F]_0
U 12DA, 0001,003C,0180,09F0,0000,12DB       ;2435               RC[0E]_D
U 12DB, 0000,003C,01C0,0A70,0000,12DC       ;2436               Q_R[0E]
U 12DC, 001D,2000,0180,0800,0010,12DD       ;2437               A[U_Q-D,CLK.UBCC
U 12DD, 0000,013C,0180,0800,0000,10C6       ;2438               Z?
U 10C6, 0000,003C,0180,0800,0000,12DE       ;2439     =0        J/ODDA4
U 10C7, 0000,003D,0180,0800,0000,1243       ;2440               ERROR1                       ; DIDN'T UTRAP
U 12DE, 001C,2034,0180,0A08,0010,12DF       ;2441     ODDA4:    LAB_R[1],ALU_LA[AND]D,CLK.UBCC
U 12DF, 0000,013C,0180,0800,0000,10C8       ;2442               Z?
U 10C8, 0000,003D,0180,0800,0000,1243       ;2443     =0        ERROR1
U 10C9, 0000,003C,0180,0800,0000,10CA       ;2444               NOP
```

```
                                         ;2445          .PAGE   "TEST BF        ODD ADDRESS UTRAP TEST 2"
                                         ;2446   ;******************************************************************
                                         ;2447   ;++
                                         ;2448   ; TEST  BF      ODD ADDRESS UTRAP TEST 2
                                         ;2449   ;
                                         ;2450   ; TEST DESCRIPTION
                                         ;2451   ;       THIS IS A TEST OF THE ODD ADDRESS DETECTION LOGIC
                                         ;2452   ;       USING CONDITIONS EACH OF WHICH SHOULD INHIBIT AN
                                         ;2453   ;       ODD ADDRESS UTRAP FROM OCCURRING.
                                         ;2454   ;       CONDITIONS TESTED INCLUDE:
                                         ;2455   ; SUBTEST 1     VA=1,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK,NOT.CONSOLE,NOT.CM
                                         ;2456   ; SUBTEST 2     VA=0,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK,NOT.CONSOLE,CM
                                         ;2457   ; SUBTEST 3     VA=1,CM,NOT.CONSOLE,DT/BYTE,MSC/NOP,MCT/READ.V.WCHK
                                         ;2458   ; SUBTEST 4     VA=1,CM,NOT.CONSOLE,DT/WORD,MSC/INH.CM.ADDR,MCT/READ.V.WCHK
                                         ;2459   ; SUBTEST 5     VA=1,CM,CONSOLE,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK
                                         ;2460   ; SUBTEST 6     VA=1,CM,NOT.CONSOLE,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.P
                                         ;2461   ;
                                         ;2462   ; ERROR DESCRIPTION
                                         ;2463   ;       UTRAP FLAG
                                         ;2464   ;
                                         ;2465   ;--
                                         ;2466   ;******************************************************************
                                         ;2467   =0
U 10CA, 0000,003D,0180,0800,0000,122F    ;2468   ODDB:   NEWTST
U 10CB, 0F18,0038,0580,09F8,0000,10CC    ;2469           RC[0F]_K[.1],D_0
U 10CC, 0000,003D,4980,3C00,0000,124C    ;2470   =0      ID[TBER0]_D,CALL,J/CSOFF
U 10CD, 0000,003C,8D80,0800,0084,72E0    ;2471           SC_K[.1F]
U 12E0, 0003,001C,6580,0A80,0084,72E1    ;2472           ALU_NOT.MASK,R[0]_ALU,SC_K[.10]
U 12E1, 0003,001C,0180,0A88,0000,10CE    ;2473           ALU_NOT.MASK,R[1]_ALU
U 10CE, 0F00,003D,0180,0800,0000,1046    ;2474   =0      D_0,CALL,J/DC.DE
U 10CF, 0000,003C,6580,0800,0084,72E2    ;2475           SC_K[.10]
U 12E2, 0001,001C,0180,0AF0,0000,12E3    ;2476           ALU_D.ORNOT.MASK,R[0E]_ALU
U 12E3, 0003,003C,0180,0AF8,0000,10D0    ;2477           R[0F]_0
                                         ;2478   ;////////////;7/////////////////////////////////////////////////////
                                         ;2479   ;+
                                         ;2480   ; SUBTEST       1
                                         ;2481   ;       VA=1,NOT.CM,NOT.CONSOLE,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK
                                         ;2482   ;-
U 10D0, 0000,003D,0180,0800,0000,1247    ;2483   =0   ,  SUBTEST
U 10D1, 0000,003C,0180,0800,0000,10D2    ;2484           NOP
U 10D2, 0000,003D,0180,0800,0000,1242    ;2485   =0      ERLOOP
U 10D3, 0F18,0038,0580,0800,0200,12E4    ;2486   ODDB1:  VA_K[.1],D_0
U 12E4, 0000,003C,3D80,3C00,0000,12E5    ;2487           ID[PSL]_D
U 12E5, 0000,003C,0180,1C00,0000,12E6    ;2488           CID/CONT
U 12E6, 0000,003C,0180,0A70,0000,12E7    ;2489           LAB_R[0E]
U 12E7, 0000,003C,0180,0AF8,0000,12E8    ;2490           R[0F]_LA
U 12E8, 0000,403C,0180,5000,0C00,12E9    ;2491           DT/WORD,MSC/CHK.ODD.ADDR,FS/MCT,MCT/READ.V.WCHK
U 12E9, 0800,003C,0180,0A78,0000,12EA    ;2492           D_R[0F]
U 12EA, 0003,003C,0180,0AF8,0000,12EB    ;2493           R[0F]_0
U 12EB, 0001,003C,0180,09F0,C000,12EC    ;2494           RC[0E]_D
U 12EC, 0000,003C,01C0,0A70,0000,12ED    ;2495           Q_R[0E]
U 12ED, 001D,2000,0180,0800,0010,12EE    ;2496           A[U_Q-D,CLK.UBCC
U 12EE, 0000,013C,0180,0800,0000,10D4    ;2497           ??
U 10D4, 0000,003C,0180,0800,0000,12EF    ;2498   =0      J/ODDB2         ; A UTRAP OCCURRED.
U 10D5, 0000,003C,0180,0800,0000,10D8    ;2499           J/ODDB3         ; NO UTRAP OCCURRED.
```

```
U 12EF, 001C,2034,0180,0A08,0010,12F0   ;2500   ODDB2:  LAB_R[1],ALU_LA[AND]D,CLK.UBCC
U 12F0, 0000,013C,0180,0800,0000,10D6   ;2501           Z?
U 10D6, 0000,003D,0180,0800,0000,1243   ;2502   =0      ERROR1          ; UTRAPPED, NON ODD ADDRESS ERROR.
U 10D7, 0000,003D,0180,0800,0000,1243   ;2503           ERROR1          ; ODD ADDRESS UTRAP OCCURRED.
                                        ;2504   ;//////////////////////////////////////////////////////////////////////
                                        ;2505   ;+
                                        ;2506   ; SUBTEST       2
                                        ;2507   ;       VA=0,CM,NOT.CONSOLE,MSC/CHK.ODD.ADD,MCT/READ.V.WCHK
                                        ;2508   ;-
                                        ;2509   =0
U 10D8, 0000,003D,0180,0800,0000,1247   ;2510   ODDB3:  SUBTEST
U 10D9, 0000,003C,0180,0800,0000,10DA   ;2511           NOP
U 10DA, 0000,003D,0180,0800,0000,1242   ;2512   =0      ERLOOP
U 10DB, 0018,0038,1980,0800,0200,12F1   ;2513           VA_K[ZERO]
U 12F1, 0800,003C,0180,0A00,0000,12F2   ;2514           D_R[0]
U 12F2, 0000,003C,3D80,3C00,0000,12F3   ;2515           ID[PSL]_D
U 12F3, 0000,003C,0180,1C00,0000,12F4   ;2516           CID/CONT
U 12F4, 0000,003C,0180,0A70,0000,12F5   ;2517           LAB_R[OE]
U 12F5, 0000,003C,0180,0AF8,0000,12F6   ;2518           R[OF]_LA
U 12F6, 0000,403C,0180,5000,0C00,12F7   ;2519           DT/WORD,MSC/CHK.ODD.ADDR,FS/MCT,MCT/READ.V.WCHK
U 12F7, 0800,003C,0180,0A78,0000,12F8   ;2520           D_R[OF]
U 12F8, 0003,003C,0180,0AF8,0000,12F9   ;2521           R[OF]_0
U 12F9, 0001,003C,0180,09F0,0000,12FA   ;2522           RC[OE]_D
U 12FA, 0000,003C,01C0,0A70,0000,12FB   ;2523           Q_R[OE]
U 12FB, 001D,2000,0180,0800,0010,12FC   ;2524           ALU_Q-D,CLK.UBCC
U 12FC, 0000,013C,0180,0800,0000,10DC   ;2525           Z?
U 10DC, 0000,003C,0180,0800,0000,12FD   ;2526   =0      J/ODDB4         ; A UTRAP OCCURRED.
U 10DD, 0000,003C,0180,0800,0000,10E0   ;2527           J/ODDB5         ; NO UTRAP OCCURRED.
U 12FD, 001C,2034,0180,0A08,0010,12FE   ;2528   ODDB4:  LAB_R[1],ALU_LA[AND]D,CLK.UBCC
U 12FE, 0000,013C,0180,0800,0000,10DE   ;2529           Z?
U 10DE, 0000,003D,0180,0800,0000,1243   ;2530   =0      ERROR1          ; UTRAPPED, NON ODD ADDRESS ERROR.
U 10DF, 0000,003D,0180,0800,0000,1243   ;2531           ERROR1          ; ODD ADDRESS UTRAP OCCURRED.
                                        ;2532   ;//////////////////////////////////////////////////////////////////////
                                        ;2533   ;+
                                        ;2534   ; SUBTEST       3
                                        ;2535   ;       VA=1,CM,NOT.CONSOLE,MSC/NOP,MCT/READ.V.WCHK
                                        ;2536   ;-
                                        ;2537   =0
U 10E0, 0000,003D,0180,0800,0000,1247   ;2538   ODDB5:  SUBTEST
U 10E1, 0000,003C,0180,0800,0000,10E2   ;2539           NOP
U 10E2, 0000,003D,0180,0800,0000,1242   ;2540   =0      ERLOOP
U 10E3, 0018,0038,0580,0800,0200,12FF   ;2541           VA_K[.1]
U 12FF, 0800,003C,0180,0A00,0000,1300   ;2542           D_R[0]
U 1300, 0000,003C,3D80,3C00,0000,1301   ;2543           ID[PSL]_D
U 1301, 0000,003C,0180,1C00,0000,1302   ;2544           CID/CONT
U 1302, 0000,003C,0180,0A70,0000,1303   ;2545           LAB_R[OE]
U 1303, 0000,003C,0180,0AF8,0000,1304   ;2546           R[OF]_LA
U 1304, 0000,803C,0180,5000,0000,1305   ;2547           DT/BYTE,MSC/NOP,FS/MCT,MCT/READ.V.WCHK
U 1305, 0800,003C,0180,0A78,0000,1306   ;2548           D_R[OF]
U 1306, 0003,003C,0180,0AF8,0000,1307   ;2549           R[OF]_0
U 1307, 0001,003C,0180,09F0,0000,1308   ;2550           RC[OE]_D
U 1308, 0000,003C,01C0,0A70,0000,1309   ;2551           Q_R[OE]
U 1309, 001D,2000,0180,0800,0010,130A   ;2552           ALU_Q-D,CLK.UBCC
U 130A, 0000,013C,0180,0800,0000,10E4   ;2553           Z?
U 10E4, 0000,003C,0180,0800,0000,130B   ;2554   =0      J/ODDB6         ; A UTRAP OCCURRED.
```

```
U 10E5, 0000,003C,0180,0800,0000,10E8    ;2555            J/ODDB7           ; NO UTRAP OCCURRED.
U 130B, 001C,2034,0180,0A08,0010,130C    ;2556    ODDB6:  LAB_R[1],ALU_LA[AND]D,CLK.UBCC
U 130C, 0000,013C,0180,0800,0000,10E6    ;2557            Z?
U 10E6, 0000,003D,0180,0800,0000,1243    ;2558    =0      ERROR1            ; UTRAPPED, NON ODD ADDRESS ERROR.
U 10E7, 0000,003D,0180,0800,0000,1243    ;2559            ERROR1            ; ODD ADDRESS UTRAP OCCURRED.
                                         ;2560    ;//////////////////////////////////////////////////////////////////
                                         ;2561    ;+
                                         ;2562    ; SUBTEST      4
                                         ;2563    ;       VA=1,CM,NOT.CONSOLE,DT/WORD,MSC/INH.CM.ADDR,MCT/READ.V.WCHK
                                         ;2564    ;-
                                         ;2565    =0
U 10E8, 0000,003D,0180,0800,0000,1247    ;2566    ODDB7:  SUBTEST
U 10E9, 0000,003C,0180,0800,0000,10EA    ;2567            NOP
U 10EA, 0000,003D,0180,0800,0000,1242    ;2568    =0      ERLOOP
U 10EB, 0018,0038,0580,0800,0200,130D    ;2569            VA_K[.1]
U 130D, 0800,003C,0180,0A00,0000,130E    ;2570            D_R[0]
U 130E, 0000,003C,3D80,3C00,0000,130F    ;2571            ID[PSL]_D
U 130F, 0000,003C,0180,1C00,0000,1310    ;2572            CID/CONT
U 1310, 0000,003C,0180,0A70,0000,1311    ;2573            LAB_R[0E]
U 1311, 0000,003C,0180,0AF8,0000,1312    ;2574            R[0F]_LA
U 1312, 0000,403C,0180,5000,3C00,1313    ;2575            DT/WORD,MSC/INH.CM.ADDR,FS/MCT,MCT/READ.V.WCHK
U 1313, 0800,003C,0180,0A78,0000,1314    ;2576            D_R[0F]
U 1314, 0003,003C,0180,0AF8,0000,1315    ;2577            R[0F]_0
U 1315, 0001,003C,0180,09F0,0000,1316    ;2578            RC[0E]_D
U 1316, 0000,003C,01C0,0A70,0000,1317    ;2579            Q_R[0E]
U 1317, 001D,2000,0180,0800,0010,1318    ;2580            ALU_Q-D,CLK.UBCC
U 1318, 0000,013C,0180,0800,0000,10EC    ;2581            Z?
U 10EC, 0000,003C,0180,0800,0000,1319    ;2582    =0      J/ODDB8           ; A UTRAP OCCURRED.
U 10ED, 0000,003C,0180,0800,0000,10F0    ;2583            J/ODDB9           ; NO UTRAP OCCURRED.
U 1319, 001C,2034,0180,0A08,0010,131A    ;2584    ODDB8:  LAB_R[1],ALU_LA[AND]D,CLK.UBCC
U 131A, 0000,013C,0180,0800,0000,10EE    ;2585            Z?
U 10EE, 0000,003D,0180,0800,0000,1243    ;2586    =0      ERROR1            ; UTRAPPED, NON ODD ADDRESS ERROR.
U 10EF, 0000,003D,0180,0800,0000,1243    ;2587            ERROR1            ; ODD ADDRESS UTRAP OCCURRED.
                                         ;2588    ;//////////////////////////////////////////////////////////////////
                                         ;2589    ;+
                                         ;2590    ; SUBTEST      5
                                         ;2591    ;       VA=1,CM,CONSOLE,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.V.WCHK
                                         ;2592    ;-
                                         ;2593    =0
U 10F0, 0000,003D,0180,0800,0000,1247    ;2594    ODDB9:  SUBTEST
U 10F1, 0000,003C,0180,0800,0000,10F2    ;2595            NOP
U 10F2, 0000,003D,0180,0800,0000,1242    ;2596    =0      ERLOOP
U 10F3, 0018,0038,0580,0800,0200,131B    ;2597            VA_K[.1]
U 131B, 0800,003C,0180,0A00,0000,131C    ;2598            D_R[0]
U 131C, 0000,003C,3D80,3C00,0000,131D    ;2599            ID[PSL]_D
U 131D, 0000,003C,0180,1400,0000,131E    ;2600            CID/ACK
U 131E, 0000,003C,0180,0A70,0000,131F    ;2601            LAB_R[0E]
U 131F, 0000,003C,0180,0AF8,0000,1320    ;2602            R[0F]_LA
U 1320, 0000,403C,0180,5000,0C00,1321    ;2603            DT/WORD,MSC/CHK.ODD.ADDR,FS/MCT,MCT/READ.V.WCHK
U 1321, 0000,003C,0180,1C00,0000,1322    ;2604            CID/CONT
U 1322, 0800,003C,0180,0A78,0000,1323    ;2605            D_R[0F]
U 1323, 0003,003C,0180,0AF8,0000,1324    ;2606            R[0F]_0
U 1324, 0001,003C,0180,09F0,0000,1325    ;2607            RC[0E]_D
U 1325, 0000,003C,01C0,0A70,0000,1326    ;2608            Q_R[0E]
U 1326, 001D,2000,0180,0800,0010,1327    ;2609            ALU_Q-D,CLK.UBCC
```

```
U 1327, 0000,013C,0180,0800,0000,10F4    ;2610               Z?
U 10F4, 0000,003C,0180,0800,0000,1328    ;2611    =0         J/ODDB10                  ; A UTRAP OCCURRED.
U 10F5, 0000,003C,0180,0800,0000,10F8    ;2612               J/ODDB11                  ; NO UTRAP OCCURRED.
U 1328, 001C,2034,0180,0A08,0010,1329    ;2613    ODDB10:  LAB_R[1],ALU_LA[AND]D,CLK.UBCC
U 1329, 0000,013C,0180,0800,0000,10F6    ;2614               Z?
U 10F6, 0000,003D,0180,0800,0000,1243    ;2615    =0         ERROR1           ; UTRAPPED, NON ODD ADDRESS ERROR.
U 10F7, 0000,003D,0180,0800,0000,1243    ;2616               ERROR1           ; ODD ADDRESS UTRAP OCCURRED.
                                         ;2617    ;//////////////////////////////////////////////////////////////////////////
                                         ;2618    ;+
                                         ;2619    ; SUBTEST        6
                                         ;2620    ;          VA=1,CM,NOT.CONSOLE,DT/WORD,MSC/CHK.ODD.ADDR,MCT/READ.P
                                         ;2621    ;-
                                         ;2622    =0
U 10F8, 0000,003D,0180,0800,0000,1247    ;2623    ODDB11:  SUBTEST
U 10F9, 0000,003C,0180,0800,0000,10FA    ;2624               NOP
U 10FA, 0000,003D,0180,0800,0000,1242    ;2625    =0         ERLOOP
U 10FB, 0018,0038,0580,0800,0200,132A    ;2626               VA_K[.1]
U 132A, 0800,003C,0180,0A00,0000,132B    ;2627               D_R[0]
U 132B, 0000,003C,3D80,3C00,0000,132C    ;2628               ID[PSL]_D
U 132C, 0000,003C,0180,1C00,0000,132D    ;2629               CID/CONT
U 132D, 0000,003C,0180,0A70,0000,132E    ;2630               LAB_R[OE]
U 132E, 0000,003C,0180,0AF8,0000,132F    ;2631               R[OF]_LA
U 132F, 0000,403C,0180,C800,0C00,1330    ;2632               DT/WORD,MSC/CHK.ODD.ADDR,FS/MCT,MCT/READ.P
U 1330, 0800,003C,0180,0A78,0000,1331    ;2633               D_R[OF]
U 1331, 0003,003C,0180,0AF8,0000,1332    ;2634               R[OF]_0
U 1332, 0001,003C,0180,09F0,0000,1333    ;2635               RC[OE]_D
U 1333, 0000,003C,01C0,0A70,0000,1334    ;2636               Q_R[OE]
U 1334, 001D,2000,0180,0800,0010,1335    ;2637               ALU_Q-D,CLK.UBCC
U 1335, 0000,013C,0180,0800,0000,10FC    ;2638               Z?
U 10FC, 0000,003C,0180,0800,0000,1336    ;2639    =0         J/ODDB12                  ; A UTRAP OCCURRED.
U 10FD, 0000,003C,0180,0800,0000,1338    ;2640               J/ODDB13                  ; NO UTRAP OCCURRED.
U 1336, 001C,2034,0180,0A08,0010,1337    ;2641    ODDB12:  LAB_R[1],ALU_LA[AND]D,CLK.UBCC
U 1337, 0000,013C,0180,0800,0000,10FE    ;2642               Z?
U 10FE, 0000,003D,0180,0800,0000,1243    ;2643    =0         ERROR1           ; UTRAPPED, NON ODD ADDRESS ERROR.
U 10FF, 0000,003D,0180,0800,0000,1243    ;2644               ERROR1           ; ODD ADDRESS UTRAP OCCURRED.
U 1338, 0000,003C,0180,0800,0000,110A    ;2645    ODDB13:  NOP
```

```
                                             ;2646        .PAGE   "TEST C0        TB MISS UTRAPS TEST 1"
                                             ;2647  ;*******************************************************************
                                             ;2648  ;++
                                             ;2649  ; TEST  C0      TB MISS UTRAPS TEST 1
                                             ;2650  ;
                                             ;2651  ; TEST DESCRIPTION
                                             ;2652  ;       THIS IS A TEST OF MCT FUNCTIONS WHICH ENABLE TB MISS TRAPS.
                                             ;2653  ;
                                             ;2654  ; ERROR DESCRIPTION
                                             ;2655  ;       CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                             ;2656  ;               0 = WRITE.V.NOCHK
                                             ;2657  ;               1 = WRITE.V.WCHK
                                             ;2658  ;               2 = READ.V.RCHK
                                             ;2659  ;               3 = READ.V.NOCHK
                                             ;2660  ;               4 = READ.V.WCHK
                                             ;2661  ;               5 = READ.V.IBCHK
                                             ;2662  ;               6 = LOCKREAD.V.NOCHK
                                             ;2663  ;               7 = LOCKREAD.V.WCHK
                                             ;2664  ;
                                             ;2665  ;--
                                             ;2666  ;*******************************************************************
                                             ;2667  =0
U 110A, 0000,003D,0180,0800,0000,122F        ;2668  TBMSE:  NEWTST
U 110B, 0018,0038,5D80,0A98,0000,1110        ;2669          R[3]_K[.7]
U 1110, 0000,003D,0180,0800,0000,124C        ;2670  =0      CALL,J/CSOFF
U 1111, 0000,003C,D580,0800,0084,7112        ;2671          SC_K[.6]
U 1112, 0003,001D,0180,0AF0,0000,12A2        ;2672  =0      ALU_NOT.MASK,R[0E]_ALU,CALL,J/TBWPTP
U 1113, 0018,0038,0580,09F8,0000,1339        ;2673          RC[0F]_K[.1]
U 1339, 0010,0038,0180,0908,0200,133A        ;2674          VA_RC[T]
U 133A, 0000,003C,0180,0900,0000,1114        ;2675          LC_RC[0]
U 1114, 0010,0039,0180,0AC0,0000,1074        ;2676  =0      R[8]_LC,CALL,J/TBWRB
U 1115, 0010,0038,0180,0920,0200,1116        ;2677          VA_RC[4]
U 1116, 0000,003D,0180,0800,0000,1242        ;2678  =0      ERLOOP
U 1117, 0800,003C,0180,0A18,0000,133B        ;2679  TBMSEA: D_R[3]
U 133B, 0001,003C,0180,09F0,0000,1118        ;2680          RC[0E]_D
U 1118, 0000,193D,0180,0A70,0000,1008        ;2681  =0      LAB_R[0E],D3-0?,CALL,J/TBTAB0
U 1119, 0800,003C,0180,0A78,0000,133C        ;2682  TBMSEB: D_R[0F]
U 133C, 0003,003C,0180,0AF8,0000,133D        ;2683          R[0F]_0
U 133D, 0001,003C,0180,0800,0010,133E        ;2684          ALU_D,CLK.UBCC
U 133E, 0000,013C,0180,0800,0000,111A        ;2685          Z?
U 111A, 0000,003D,0180,0800,0000,1243        ;2686  =0      ERROR1                  ; NO UTRAP
U 111B, 0000,003C,0180,0A18,0010,133F        ;2687          ALU_R[3],CLK.UBCC
U 133F, 0000,013C,0180,0800,0000,111C        ;2688          Z?
U 111C, 0018,0000,0580,0A98,0000,1117        ;2689  =0      R[3]_LA-K[.1],J/TBMSEA
U 111D, 0000,003C,0180,0800,0000,111E        ;2690          NOP
```

```
                                               .PAGE    "TEST C1        TB MISS UTRAPS TEST 2"
                                        ;****************************************************************
                                        ;++
                                        ; TEST  C1      TB MISS UTRAPS TEST 2
                                        ;
                                        ; TEST DESCRIPTION
                                        ;      THIS IS A TEST OF ALL THE MCT FUNCTIONS WHICH DISABLE
                                        ;      TB MISS UTRAPS.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;      CODE WHICH IDENTIFIES THE MCT FUNCTION BEING TESTED
                                        ;          ERR1
                                        ;              0 = TEST.RCHK
                                        ;              1 = MEM.NOP
                                        ;              2 = TEST.WCHK
                                        ;              3 = READ.V.NEWPC
                                        ;          ERR2
                                        ;              0 = SBI.HOLD
                                        ;              1 = SBI.HOLD+UNJAM
                                        ;              2 = INVALIDATE
                                        ;              3 = VALIDATE
                                        ;              4 = EXTWRITE.P
                                        ;              5 = WRITE.P
                                        ;              6 = LOCKWRITE.P
                                        ;              7 = READ.P
                                        ;              8 = READ.INT.SUM
                                        ;              9 = LOCKREAD.P
                                        ;              A = ALLOW.IB.READ
                                        ;              B = MCT/17
                                        ;              C = MCT/37
                                        ;
                                        ;--
                                        ;****************************************************************
                                        =0
U 111E, 0000,003D,0180,0800,0000,122F   TBMSD:  NEWTST
U 111F, 0018,0038,0D80,0A98,0000,1120           R[3]_K[.3]
U 1120, 0000,003D,0180,0800,0000,124C   =0      CALL,J/CSOFF
U 1121, 0000,003C,D580,0800,0084,7122           SC_K[.6]
U 1122, 0003,001D,0180,0AF0,0000,12A2   =0      ALU_NOT.MASK,R[0E]_ALU,CALL,J/TBWPTP
U 1123, 0018,0038,0580,09F8,0000,1340           RC[0F]_K[.1]
U 1340, 0010,0038,0180,0908,0200,1341           VA_RC[1]
U 1341, 0000,003C,0180,0900,0000,1124           LC_RC[0]
U 1124, 0010,0039,0180,0AC0,0000,1074   =0      R[8]_LC,CALL,J/TBWRB
U 1125, 0010,0038,0180,0920,0200,1126           VA_RC[4]
U 1126, 0000,003D,0180,0800,0000,1242   =0      ER[OOP
U 1127, 0800,003C,0180,0A18,0000,1342   TBMSDA: D_R[3]
U 1342, 0001,003C,0180,09F0,0000,1128           RC[0E]_D
U 1128, 0000,193D,0180,0A70,0000,1004   =0      LAB_R[0E],D3-0?,CALL,J/TBTAB1
U 1129, 0800,003C,0180,0A78,0000,1343           D_R[0F]
U 1343, 0003,003C,0180,0AF8,0000,1344           R[0F]_0
U 1344, 0001,003C,0180,0800,0010,1345           ALU_D,CLK.UBCC
U 1345, 0000,013C,0180,0800,0000,112A           Z?
U 112A, 0000,003C,0180,0A18,0010,1346   =0      ALU_R[3],CLK.UBCC,J/TBMSDB

                                        ;ERR1
```

```
U 112B, 0000,003D,0180,0800,0000,1243   ;2746           ERROR1                          ; UTRAPPED
U 1346, 0000,013C,0180,0800,0000,112C   ;2747   TBMSDB: Z?
U 112C, 0018,0000,0580,0A98,0000,1127   ;2748   =0      R[3]_LA-K[.1],J/TBMSDA
U 112D, 0018,0038,8580,0A98,0000,112E   ;2749           R[3]_K[.C]
U 112E, 0000,003D,0180,0800,0000,1242   ;2750   =0      ERLOOP
U 112F, 0800,003C,0180,0A18,0000,1347   ;2751   TBMSDC: D_R[3]
U 1347, 0001,003C,0180,09F0,0000,1130   ;2752           R[0E]_D
U 1130, 0000,193D,0180,0A70,0000,1010   ;2753   =0      LAB_R[0E],D3-0?,CALL,J/TBTAB2
U 1131, 0800,003C,0180,0A78,0000,1348   ;2754           D_R[0F]
U 1348, 0003,003C,0180,0AF8,0000,1349   ;2755           R[0F]_0
U 1349, 0001,003C,0180,0800,0010,134A   ;2756           ALU_D,CLK.UBCC
U 134A, 0000,013C,0180,0800,0000,1132   ;2757           Z?
U 1132, 0000,003C,0180,0A18,0010,134B   ;2758   =0      ALU_R[3],CLK.UBCC,J/TBMSDD
                                        ;2759
                                        ;2760   ;ERR2
U 1133, 0000,003D,0180,0800,0000,1243   ;2761           ERROR1                          ; UTRAPPED
U 134B, 0000,013C,0180,0800,0000,1134   ;2762   TBMSDD: Z?
U 1134, 0018,0000,0580,0A98,0000,112F   ;2763   =0      R[3]_LA-K[.1],J/TBMSDC
U 1135, 0000,003C,0180,0800,0000,1136   ;2764           NOP
```

```
                                           ;2765            .PAGE   "TEST C2        ACCESS VIOLATION UTRAPS TEST 1"
                                           ;2766    ;*********************************************************************
                                           ;2767    ;++
                                           ;2768    ; TEST  C2      ACCESS VIOLATION UTRAPS TEST 1
                                           ;2769    ;
                                           ;2770    ; TEST DESCRIPTION
                                           ;2771    ;       THIS IS A TEST OF THE MCT FUNCTIONS WHICH ENABLE ACCESS VIOLATION
                                           ;2772    ;       CHECK. AN ACCESS CODE (PTE<30:27>=0) ALLOWING NO ACCESS IS
                                           ;2773    ;       USED
                                           ;2774    ;
                                           ;2775    ; ERROR DESCRIPTION
                                           ;2776    ;       CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                           ;2777    ;               0 = WRITE.V.WCHK
                                           ;2778    ;               1 = READ.V.RCHK
                                           ;2779    ;               2 = READ.V.WCHK
                                           ;2780    ;               3 = READ.V.IBCHK
                                           ;2781    ;               4 = LOCKREAD.V.WCHK
                                           ;2782    ;
                                           ;2783    ;--
                                           ;2784    ;***********************************************************^*********
                                           ;2785    =0
U 1136, 0000,003D,0180,0800,0000,122F      ;2786    TBACE:  NEWTST
U 1137, 0018,0038,1180,0A98,0000,1138      ;2787            R[3]_K[.4]
U 1138, 0000,003D,0180,0800,0000,124C      ;2788    =0      CALL,J/CSOFF
U 1139, 0000,003C,1180,0800,0084,713A      ;2789            SC_K[.4]
U 113A, 0003,001D,0180,0AF0,0000,12A2      ;2790    =0      ALU_NOT.MASK,R[0E]_ALU,CALL,J/TBWPTP
U 113B, 0018,0038,0580,09F8,0000,134C      ;2791            RC[0F]_K[.1]
U 134C, 0010,0038,5180,0908,0284,734D      ;2792            VA_RC[1],SC_K[.1E]
U 134D, 0810,0038,0580,0900,0084,B13C      ;2793            D_RC[0],SC_SC-K[.1]
U 113C, 0001,0035,0180,0AC0,0000,1074      ;2794    =0      ALU_D.AND.MASK,R[8]_ALU,CALL,J/TBWRB
U 113D, 0000,003C,0180,0800,0000,113E      ;2795            NOP
U 113E, 0000,003D,0180,0800,0000,1242      ;2796    =0      ERLOOP
U 113F, 0800,003C,0180,0A18,0000,134E      ;2797    TBACE1: D_R[3]
U 134E, 0001,003C,0180,09F0,0000,1140      ;2798            RC[0E]_D
U 1140, 0000,193D,0180,0A70,0000,1040      ;2799    =0      LAB_R[0E],D3-0?,CALL,J/TBTAB3
U 1141, 0800,003C,0180,0A78,0000,134F      ;2800            D_R[0F]
U 134F, 0003,003C,0180,0AF8,0000,1350      ;2801            R[0F]_0
U 1350, 0001,003C,0180,0800,0010,1351      ;2802            ALU_D,CLK.UBCC
U 1351, 0000,013C,0180,0800,0000,1142      ;2803            Z?
U 1142, 0000,003D,0180,0800,0000,1243      ;2804    =0      ERROR1
U 1143, 0000,003C,0180,0A18,0010,1352      ;2805            ALU_R[3],CLK.UBCC
U 1352, 0000,013C,0180,0800,0000,1144      ;2806            Z?
U 1144, 0018,0000,0580,0A98,0000,113F      ;2807    =0      R[3]_LA-K[.1],J/TBACE1
U 1145, 0000,003C,0180,0800,0000,1146      ;2808            NOP
```

```
                                           ;2809          .PAGE   "TEST C3        ACCESS VIOLATION UTRAPS TEST 2"
                                           ;2810   ;*****************************************************************
                                           ;2811   ;++
                                           ;2812   ; TEST  C3      ACCESS VIOLATION UTRAPS TEST 2
                                           ;2813   ;
                                           ;2814   ; TEST DESCRIPTION
                                           ;2815   ;        THIS IS A TEST OF MCT FUNCTIONS WHICH
                                           ;2816   ;        DISABLE ACCESS VIOLATION CHECKS. HERE AN ACCESS
                                           ;2817   ;        CODE (PTE<30:27>=0) ALLOWING NO ACCESS IS USED.
                                           ;2818   ;
                                           ;2819   ; ERROR DESCRIPTION
                                           ;2820   ;        CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                           ;2821   ;            ERR1
                                           ;2822   ;                0 = TEST.RCHK
                                           ;2823   ;                1 = MEM.NOP
                                           ;2824   ;                2 = TEST.WCHK
                                           ;2825   ;                3 = WRITE.V.NOCHK
                                           ;2826   ;                4 = READ.V.NOCHK
                                           ;2827   ;                5 = READ.V.NEWPC
                                           ;2828   ;                6 = LOCKREAD.V.NOCHK
                                           ;2829   ;            ERR2
                                           ;2830   ;                0   SBI.HOLD
                                           ;2831   ;                1 = SBI.HOLD+UNJAM
                                           ;2832   ;                2 = INVALIDATE
                                           ;2833   ;                3 = VALIDATE
                                           ;2834   ;                4 = EXTWRITE.P
                                           ;2835   ;                5 = WRITE.P
                                           ;2836   ;                6 = LOCKWRITE.P
                                           ;2837   ;                7 = READ.P
                                           ;2838   ;                8 = READ.INT.SUM
                                           ;2839   ;                9 = LOCKREAD.P
                                           ;2840   ;                A = ALLOW.IB.READ
                                           ;2841   ;                B = MCT/17
                                           ;2842   ;                C = MCT/37
                                           ;2843   ;
                                           ;2844   ;--
                                           ;2845   ;*****************************************************************
                                           ;2846   =0
U 1146, 0000,003D,0180,0800,0000,122F      ;2847   TBACD:  NEWTST
U 1147, 0018,0038,D580,0A98,0000,1148      ;2848           R[3]_K[.6]
U 1148, 0000,003D,0180,0800,0000,124C      ;2849   =0      CALL,J/CSOFF
U 1149, 0000,003C,1180,0800,0084,714A      ;2850           SC_K[.4]
U 114A, 0003,001D,0180,0AF0,0000,12A2      ;2851   =0      ALU_NOT.MASK,R[0E]_ALU,CALL,J/TBWPTP
U 114B, 0018,0038,0580,09F8,0000,1353      ;2852           RC[0F]_K[.1]
U 1353, 0010,0038,5180,0908,0284,7354      ;2853           VA_RC[1],SC_K[.1E]
U 1354, 0810,0038,0580,0900,0084,B14C      ;2854           D_RC[0],SC_SC-K[.1]
U 114C, 0001,0035,0180,0AC0,0000,1074      ;2855   =0      ALU_D.AND.MASK,R[8]_ALU,CALL,J/TBWRB
U 114D, 0000,003C,0180,0800,0000,114E      ;2856           NOP
U 114E, 0000,003D,0180,0800,0000,1242      ;2857   =0      ERLOOP
U 114F, 0800,003C,0180,0A18,0000,1355      ;2858   TBACD1: D_R[3]
U 1355, 0001,003C,0180,09F0,0000,1150      ;2859           RC[0E]_D
U 1150, 0000,193D,0180,0A70,0000,1050      ;2860   =0      LAB_R[0E],D3-0?,CALL,J/TBTAB4
U 1151, 0800,003C,0180,0A78,0000,1356      ;2861           D_R[0F]
U 1356, 0003,003C,0180,0AF8,0000,1357      ;2862           R[0F]_0
U 1357, 0001,003C,0180,0800,0010,1358      ;2863           ALU_D,CLK.UBCC
```

```
U 1358, 0000,013C,0180,0800,0000,1152   ;2864              Z?
U 1152, 0000,003C,0180,0A18,0010,1359   ;2865   =0         ALU_R[3],CLK.UBCC,J/TBACD2
                                        ;2866
                                        ;2867   ;ERR1
U 1153, 0000,003D,0180,0800,0000,1243   ;2868              ERROR1                  ; UTRAPPED
U 1359, 0000,013C,0180,0800,0000,1156   ;2869   TBACD2:    Z?
U 1156, 0018,0000,0580,0A98,0000,114F   ;2870   =0         R[3]_LA-K[.1],J/TBACD1
U 1157, 0018,0038,8580,0A98,0000,1158   ;2871              R[3]_K[.C]
U 1158, 0000,003D,0180,0800,0000,1242   ;2872   =0         ERLOOP
U 1159, 0800,003C,0180,0A18,0000,135A   ;2873   TBACD3:    D_R[3]
U 135A, 0001,003C,0180,09F0,0000,115A   ;2874              R[0E]_D
U 115A, 0000,193D,0180,0A70,0000,1010   ;2875   =0         LAB_R[0E],D3-0?,CALL,J/TBTAB2
U 115B, 0800,003C,0180,0A78,0000,135B   ;2876              D_R[0F]
U 135B, 0003,003C,0180,0AF8,0000,135C   ;2877              R[0F]_0
U 135C, 0001,003C,0180,0800,0010,135D   ;2878              ALU_D,CLK.UBCC
U 135D, 0000,013C,0180,0800,0000,115C   ;2879              Z?
U 115C, 0000,003C,0180,0A18,0010,135E   ;2880   =0         ALU_R[3],CLK.UBCC,J/TBACD4
                                        ;2881
                                        ;2882   ;ERR2
U 115D, 0000,003D,0180,0800,0000,1243   ;2883              ERROR1                  ; UTRAPPED
U 135E, 0000,013C,0180,0800,0000,115E   ;2884   TBACD4:    Z?
U 115E, 0018,0000,0580,0A98,0000,1159   ;2885   =0         R[3]_LA-K[.1],J/TBACD3
U 115F, 0000,003C,0180,0800,0000,1160   ;2886              NOP
```

```
                                           ;2887            .PAGE   "TEST C4        ACCESS VIOLATION UTRAPS TEST 3"
                                           ;2888    ;*******************************************************************
                                           ;2889    ;++
                                           ;2890    ; TEST  C4      ACCESS VIOLATION UTRAPS TEST 3
                                           ;2891    ;
                                           ;2892    ; TEST DESCRIPTION
                                           ;2893    ;       THIS IS A TEST OF MCT FUNCTIONS WHICH ENABLE
                                           ;2894    ;       ACCESS VIOLATION CHECKS. AN ACCESS CODE
                                           ;2895    ;       (PTE<30:27>=F) ALLOWING ONLY READ ACCESS
                                           ;2896    ;       IS USED.
                                           ;2897    ;
                                           ;2898    ; ERROR DESCRIPTION
                                           ;2899    ;       CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                           ;2900    ;               0 = WRITE.V.WCHK
                                           ;2901    ;               1 = READ.V.WCHK
                                           ;2902    ;               2 = LOCKREAD.V.WCHK
                                           ;2903    ;
                                           ;2904    ;--
                                           ;2905    ;*******************************************************************
                                           ;2906    =0
U 1160, 0000,003D,0180,0800,0000,122F      ;2907    TBACN:  NEWTST
U 1161, 0018,0038,0980,0A98,0000,1162      ;2908            R[3]_K[.2]
U 1162, 0000,003D,0180,0800,0000,124C      ;2909    =0      CALL,J/CSOFF
U 1163, 0000,003C,1180,0800,0084,7164      ;2910            SC_K[.4]
U 1164, 0003,001D,0180,0AF0,0000,12A2      ;2911    =0      ALU_NOT.MASK,R[0E]_ALU,CALL,J/TBWPTP
U 1165, 0018,0038,0580,09F8,0000,135F      ;2912            RC[0F]_K[.1]
U 135F, 0010,0038,0180,0908,0200,1360      ;2913            VA_RC[T]
U 1360, 0810,0038,5180,0900,0084,7361      ;2914            D_RC[0],SC_K[.1E]
U 1361, 0801,001C,0580,0800,0084,B362      ;2915            ALU_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
U 1362, 0801,001C,0580,0800,0084,B363      ;2916            ALU_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
U 1363, 0801,001C,0580,0800,0084,B166      ;2917            ALU_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
U 1166, 0001,001D,0180,0AC0,0000,1074      ;2918    =0      ALU_D.ORNOT.MASK,R[8]_ALU,CALL,J/TBWRB
U 1167, 0000,003C,0180,0800,0000,1168      ;2919            NOP
U 1168, 0000,003D,0180,0800,0000,1242      ;2920    =0      ERLOOP
U 1169, 0800,003C,0180,0A18,0000,1364      ;2921    TBACN1: D_R[3]
U 1364, 0001,003C,0180,09F0,0000,116A      ;2922            R[0E]_D
U 116A, 0000,193D,0180,0A70,0000,102C      ;2923    =0      LAB_R[0E],D3-0?,CALL,J/TBTAB5
U 116B, 0800,003C,0180,0A78,0000,1365      ;2924            D_R[0F]
U 1365, 0003,003C,0180,0AF8,0000,1366      ;2925            R[0F]_0
U 1366, 0001,003C,0180,0800,0010,1367      ;2926            ALU_D,CLK.UBCC
U 1367, 0000,013C,0180,0800,0000,116C      ;2927            Z?
U 116C, 0000,003D,0180,0800,0000,1243      ;2928    =0      ERROR1
U 116D, 0000,003C,0180,0A18,0010,1368      ;2929            ALU_R[3],CLK.UBCC
U 1368, 0000,013C,0180,0800,0000,116E      ;2930            Z?
U 116E, 0018,0000,0580,0A98,0000,1169      ;2931    =0      R[3]_LA-K[.1],J/TBACN1
U 116F, 0000,003C,0180,0800,0000,1170      ;2932            NOP
```

```
                                          ;2933         .PAGE   "TEST C5        ACCESS VIOLATION UTRAPS TEST 4"
                                          ;2934   ;******************************************************************
                                          ;2935   ;++
                                          ;2936   ; TEST  C5      ACCESS VIOLATION UTRAPS TEST 4
                                          ;2937   ;
                                          ;2938   ; TEST DESCRIPTION
                                          ;2939   ;       THIS IS A TEST OF MCT FUNCTIONS WHICH DISABLE UTRAPS
                                          ;2940   ;       ON ACCESS VIOLATIONS USING AN ACCESS CODE (PTE<30:27>=F)
                                          ;2941   ;       WHICH ALLOWS READ ACCESSES ONLY.
                                          ;2942   ;
                                          ;2943   ; ERROR DESCRIPTION
                                          ;2944   ;       CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                          ;2945   ;           ERR1
                                          ;2946   ;               0 = TEST.RCHK
                                          ;2947   ;               1 = MEM.NOP
                                          ;2948   ;               2 = TEST.WCHK
                                          ;2949   ;               3 = WRITE.V.NOCHK
                                          ;2950   ;               4 = READ.V.RCHK
                                          ;2951   ;               5 = READ.V.NOCHK
                                          ;2952   ;               6 = READ.V.NEWPC
                                          ;2953   ;               7 = LOCKREAD.V.NOCHK
                                          ;2954   ;           ERR2
                                          ;2955   ;               0 = SBI.HOLD
                                          ;2956   ;               1 = SBI.HOLD+UNJAM
                                          ;2957   ;               2 = INVALIDATE
                                          ;2958   ;               3 = VALIDATE
                                          ;2959   ;               4 = EXTWRITE.P
                                          ;2960   ;               5 = WRITE.P
                                          ;2961   ;               6 = LOCKWRITE.P
                                          ;2962   ;               7 = READ.P
                                          ;2963   ;               8 = READ.INT.SUM
                                          ;2964   ;               9 = LOCKREAD.P
                                          ;2965   ;               A = ALLOW.IB.READ
                                          ;2966   ;               B = MCT/17
                                          ;2967   ;               C = MCT/37
                                          ;2968   ;
                                          ;2969   ;--
                                          ;2970   ;******************************************************************
                                          ;2971   =0
U 1170, 0000,003D,0180,0800,0000,122F     ;2972   TBACM:  NEWTST
U 1171, 0018,0038,5D80,0A98,0000,1172     ;2973           R[3]_K[.7]
U 1172, 0000,003D,0180,0800,0000,124C     ;2974   =0      CALL,J/CSOFF
U 1173, 0000,003C,1180,0800,0084,7174     ;2975           SC_K[.4]
U 1174, 0003,001D,0180,0AF0,0000,12A2     ;2976   =0      ALU_NOT.MASK,R[OE]_ALU,CALL,J/TBWPTP
U 1175, 0018,0038,0580,09F8,0000,1369     ;2977           RC[OF]_K[.1]
U 1369, 0010,0038,0180,0908,0200,136A     ;2978           VA_RC[T]
U 136A, 0810,0038,5180,0900,0084,736B     ;2979           D_RC[0],SC_K[.1E]
U 136B, 0801,001C,0580,0800,0084,B36C     ;2980           A[U_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
U 136C, 0801,001C,0580,0800,0084,B36D     ;2981           ALU_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
U 136D, 0801,001C,0580,0800,0084,B176     ;2982           ALU_D.ORNOT.MASK,D_ALU,SC_SC-K[.1]
U 1176, 0001,001D,0180,0AC0,0000,1074     ;2983   =0      ALU_D.ORNOT.MASK,R[8]_ALU,CALL,J/TBWRB
U 1177, 0000,003C,0180,0800,0000,1178     ;2984           NOP
U 1178, 0000,003D,0180,0800,0000,1242     ;2985   =0      ERLOOP
U 1179, 0800,003C,0180,0A18,0000,136E     ;2986   TBACM1: D_R[3]
U 136E, 0001,003C,0180,09F0,0000,117A     ;2987           RC[OE]_D
```

```
U 117A, 0000,193D,0180,0A70,0000,1060    ;2988   =0       LAB_R[0E],D3-0?,CALL,J/TBTAB6
U 117B, 0800,003C,0180,0A78,0000,136F    ;2989            D_R[0F]
U 136F, 0003,003C,0180,0AF8,0000,1370    ;2990            R[0F]_0
U 1370, 0001,003C,0180,0800,0010,1371    ;2991            ALU_D,CLK.UBCC
U 1371, 0000,013C,0180,0800,0000,1180    ;2992            Z?
U 1180, 0000,003C,0180,0A18,0010,1372    ;2993   =0       ALU_R[3],CLK.UBCC,J/TBACM2
                                         ;2994
                                         ;2995   ;ERR1
U 1181, 0000,003D,0180,0800,0000,1243    ;2996            ERROR1                          ; UTRAPPED
U 1372, 0000,013C,0180,0800,0000,1182    ;2997   TBACM2:  Z?
U 1182, 0018,0000,0580,0A98,0000,1179    ;2998   =0       R[3]_LA-K[.1],J/TBACM1
U 1183, 0018,0038,8580,0A98,0000,1184    ;2999            R[3]_K[.C]
U 1184, 0000,003D,0180,0800,0000,1242    ;3000   =0       ERLOOP
U 1185, 0800,003C,0180,0A18,0000,1373    ;3001   TBACM3:  D_R[3]
U 1373, 0001,003C,0180,09F0,0000,1186    ;3002            R[0E]_D
U 1186, 0000,193D,0180,0A70,0000,1010    ;3003   =0       LAB_R[0E],D3-0?,CALL,J/TBTAB2
U 1187, 0800,003C,0180,0A78,0000,1374    ;3004            D_R[0F]
U 1374, 0003,003C,0180,0AF8,0000,1375    ;3005            R[0F]_0
U 1375, 0001,003C,0180,0800,0010,1376    ;3006            ALU_D,CLK.UBCC
U 1376, 0000,013C,0180,0800,0000,1188    ;3007            Z?
U 1188, 0000,003C,0180,0A18,0010,1377    ;3008   =0       ALU_R[3],CLK.UBCC,J/TBACM4
                                         ;3009
                                         ;3010   ;ERR2
U 1189, 0000,003D,0180,0800,0000,1243    ;3011            ERROR1                          ; UTRAPPED
U 1377, 0000,013C,0180,0800,0000,118A    ;3012   TBACM4:  Z?
U 118A, 0018,0000,0580,0A98,0000,1185    ;3013   =0       R[3]_LA-K[.1],J/TBACM3
U 118B, 0000,003C,0180,0800,0000,118C    ;3014            NOP
```

```
                                          ;3015        .PAGE   "TEST C6        M BIT UTRAPS TEST 1"
                                          ;3016  ;**************************************************************
                                          ;3017  ;++
                                          ;3018  ; TEST  C6      M BIT UTRAPS TEST 1
                                          ;3019  ;
                                          ;3020  ; TEST DESCRIPTION
                                          ;3021  ;      THIS IS A TEST OF THE MCT FUNCTIONS WHICH ENABLE MODIFY BIT
                                          ;3022  ;      UTRAPS.
                                          ;3023  ;
                                          ;3024  ; ERROR DESCRIPTION
                                          ;3025  ;      CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                          ;3026  ;              0 = WRITE.V.WCHK
                                          ;3027  ;              1 = READ.V.WCHK
                                          ;3028  ;              2 = LOCKREAD.V.WCHK
                                          ;3029  ;
                                          ;3030  ;--
                                          ;3031  ;**************************************************************
                                          ;3032  =0
U 118C, 0000,003D,0180,0800,0000,122F     ;3033  TBMBE:  NEWTST
U 118D, 0018,0038,0980,0A98,0000,118E     ;3034          R[3]_K[.2]
U 118E, 0000,003D,0180,0800,0000,124C     ;3035  =0      CALL,J/CSOFF
U 118F, 0000,003C,0D80,0800,0084,7190     ;3036          SC_K[.3]
U 1190, 0003,001D,0180,0AF0,0000,12A2     ;3037  =0      ALU_NOT.MASK,R[0E]_ALU,CALL,J/TBWPTP
U 1191, 0018,0038,0580,09F8,0000,1378     ;3038          RC[0F]_K[.1]
U 1378, 0010,0038,0180,0908,0200,1379     ;3039          VA_RC[T]
U 1379, 0000,003C,E580,0800,0084,737A     ;3040          SC_K[.1A]
U 137A, 0810,0038,0180,0900,0000,1192     ;3041          D_RC[0]
U 1192, 0001,0035,0180,0AC0,0000,1074     ;3042  =0      ALU_D.AND.MASK,R[8]_ALU,CALL,J/TBWRB
U 1193, 0000,003C,0180,0800,0000,1174     ;3043          NOP
U 1194, 0000,003D,0180,0800,0000,1242     ;3044  =0      ERLOOP
U 1195, 0800,003C,0180,0A18,0000,137B     ;3045  TBMBE1: D_R[3]
U 137B, 0001,003C,0180,09F0,0000,1196     ;3046          R[0E]_D
U 1196, 0000,193D,0180,0A70,0000,103C     ;3047  =0      LAB_R[0E],D3-0?,CALL,J/TBTAB7
U 1197, 0800,003C,0180,0A78,0000,137C     ;3048  TBMBE2: D_R[0F]
U 137C, 0003,003C,0180,0AF8,0000,137D     ;3049          R[0F]_0
U 137D, 0001,003C,0180,0800,0010,137E     ;3050          ALU_D,CLK.UBCC
U 137E, 0000,013C,0180,0800,0000,1198     ;3051          Z?
U 1198, 0000,003D,0180,0800,0000,1243     ;3052  =0      ERROR1                  ; DIDN'T UTRAP
U 1199, 0000,003C,0180,0A18,0010,137F     ;3053          ALU_R[3],CLK.UBCC
U 137F, 0000,013C,0180,0800,0000,119A     ;3054          Z?
U 119A, 0018,0000,0580,0A98,0000,1195     ;3055  =0      R[3]_LA-K[.1],J/TBMBE1
U 119B, 0000,003C,0180,0800,0000,119C     ;3056          NOP
```

```
                                          ;3057         .PAGE   "TEST C7        M BIT UTRAPS TEST 2"
                                          ;3058   ;*****************************************************************
                                          ;3059   ;++
                                          ;3060   ; TEST  C7      M BIT UTRAPS TEST 2
                                          ;3061   ;
                                          ;3062   ; TEST DESCRIPTION
                                          ;3063   ;       THIS IS A TEST OF MCT FUNCTIONS WHICH INHIBIT TB MODIFY
                                          ;3064   ;       BIT UTRAPS.
                                          ;3065   ;
                                          ;3066   ; ERROR DESCRIPTION
                                          ;3067   ;       CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                          ;3068   ;           ERR1
                                          ;3069   ;               0 = TEST.RCHK
                                          ;3070   ;               1 = MEM.NOP
                                          ;3071   ;               2 = TEST.WCHK
                                          ;3072   ;               3 = WRITE.V.NOCHK
                                          ;3073   ;               4 = READ.V.RCHK
                                          ;3074   ;               5 = READ.V.NOCHK
                                          ;3075   ;               6 = READ.V.NEWPC
                                          ;3076   ;               7 = LOCKREAD.V.NOCHK
                                          ;3077   ;           ERR2
                                          ;3078   ;               0 = SBI.HOLD
                                          ;3079   ;               1 = SBI.HOLD+UNJAM
                                          ;3080   ;               2 = INVALIDATE
                                          ;3081   ;               3 = VALIDATE
                                          ;3082   ;               4 = EXTWRITE.P
                                          ;3083   ;               5 = WRITE.P
                                          ;3084   ;               6 = LOCKWRITE.P
                                          ;3085   ;               7 = READ.P
                                          ;3086   ;               8 = READ.INT.SUM
                                          ;3087   ;               9 = LOCKREAD.P
                                          ;3088   ;               A = ALLOW.IB.READ
                                          ;3089   ;               B = MCT/17
                                          ;3090   ;               C = MCT/37
                                          ;3091   ;
                                          ;3092   ;--
                                          ;3093   ;*****************************************************************
                                          ;3094   =0
U 119C, 0000,003D,0180,0800,0000,122F     ;3095   TBMBD:  NEWTST
U 119D, 0018,0038,5D80,0A98,0000,119E     ;3096           R[3]_K[.7]
U 119E, 0000,003D,0180,0800,0000,124C     ;3097   =0      CALL,J/CSOFF
U 119F, 0000,003C,0D80,0800,0084,71A0     ;3098           SC_K[.3]
U 11A0, 0003,001D,0180,0AF0,0000,12A2     ;3099   =0      ALU_NOT.MASK,R[0E]_ALU,CALL,J/TBWPTP
U 11A1, 0018,0038,0580,09F8,0000,1380     ;3100           RC[0F]_K[.1]
U 1380, 0010,0038,0180,0908,0200,1381     ;3101           VA_RC[1]
U 1381, 0000,003C,E580,0800,0084,7382     ;3102           SC_K[.1A]
U 1382, 0810,0038,0180,0900,0000,11A2     ;3103           D_RC[0]
U 11A2, 0001,0035,0180,0AC0,0000,12A2     ;3104   =0      ALU_D.AND.MASK,R[8]_ALU,CALL,J/TBWPTP
U 11A3, 0000,003C,0180,0800,0000,11A4     ;3105           NOP
U 11A4, 0000,003D,0180,0800,0000,1242     ;3106   =0      ERLOOP
U 11A5, 0800,003C,0180,0A18,0000,1383     ;3107   TBMBD1: D_R[3]
U 1383, 0001,003C,0180,09F0,0000,11A6     ;3108           RC[0E]_D
U 11A6, 0000,193D,0180,0A70,0000,1068     ;3109   =0      LAB_R[0E],D3-0?,CALL,J/TBTAB8
U 11A7, 0800,003C,0180,0A40,0000,1384     ;3110           D_R[08]
U 1384, 0003,003C,0180,0AF8,0000,1385     ;3111           R[0F]_0
```

```
U 1385, 0001,003C,0180,0800,0010,1386   ;3112                   ALU_D,CLK.UBCC
U 1386, 0000,013C,0180,0800,0000,11A8   ;3113                   Z?
U 11A8, 0000,003C,0180,0A18,0010,1387   ;3114   =0              ALU_R[3],CLK.UBCC,J/TBMBD2
                                        ;3115
                                        ;3116   ;ERR1
U 11A9, 0000,003D,0180,0800,0000,1243   ;3117                   ERROR1                          ; UTRAPPED
U 1387, 0000,013C,0180,0800,0000,11AA   ;3118   TBMBD2: Z?
U 11AA, 0018,0000,0580,0A98,0000,11A5   ;3119   =0              R[3]_LA-K[.1],J/TBMBD1
U 11AB, 0018,0038,8580,0A98,0000,11AC   ;3120                   R[3]_K[.C]
U 11AC, 0000,003D,0180,0800,0000,1242   ;3121   =0              ERLOOP
U 11AD, 0800,003C,0180,0A18,0000,1388   ;3122   TBMBD3: D_R[3]
U 1388, 0001,003C,0180,09F0,0000,11AE   ;3123                   R[0E]_D
U 11AE, 0000,193D,0180,0A70,0000,1010   ;3124   =0              LAB_R[0E],D3-0?,CALL,J/TBTAB2
U 11AF, 0800,003C,0180,0A78,0000,1389   ;3125                   D_R[0F]
U 1389, 0003,003C,0180,0AF8,0000,138A   ;3126                   R[0F]_0
U 138A, 0001,003C,0180,0800,0010,138B   ;3127                   ALU_D,CLK.UBCC
U 138B, 0000,013C,0180,0800,0000,11B0   ;3128                   Z?
U 11B0, 0000,003C,0180,0A18,0010,138C   ;3129   =0              ALU_R[3],CLK.UBCC,J/TBMBD4
                                        ;3130
                                        ;3131   ;ERR2
U 11B1, 0000,003D,0180,0800,0000,1243   ;3132                   ERROR1                          ; UTRAPPED
U 138C, 0000,013C,0180,0800,0000,11B2   ;3133   TBMBD4: Z?
U 11B2, 0018,0000,0580,0A98,0000,11AD   ;3134   =0              R[3]_LA-K[.1],J/TBMBD3
U 11B3, 0000,003C,0180,0800,0000,11B4   ;3135                   NOP
```

```
                                             .PAGE   "TEST C8        ALIGNMENT UTRAPS TEST 1"
                                     ;*******************************************************************
                                     ;++
                                     ; TEST  C8      ALIGNMENT UTRAPS TEST 1
                                     ;
                                     ; TEST DESCRIPTION
                                     ;      THIS IS A TEST OF MCT FUNCTIONS WHICH ENABLE ALIGNMENT UTRAPS.
                                     ;
                                     ; ERROR DESCRIPTION
                                     ;      CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                     ;              0 = WRITE.V.WCHK
                                     ;              1 = READ.V.RCHK
                                     ;              2 = READ.V.WCHK
                                     ;              3 = READ.V.IBCHK
                                     ;
                                     ;--
                                     ;*******************************************************************
                                     =0
U 11B4, 0000,003D,0180,0800,0000,122F  TBALE:  NEWTST
U 11B5, 0018,0038,0D80,0A98,0000,11B6          R[3]_K[.3]
U 11B6, 0000,003D,0180,0800,0000,124C  =0      CALL,J/CSOFF
U 11B7, 0F18,0038,0980,0AF0,0000,138D          R[0E]_K[.2],D_0
U 138D, 0000,003C,4980,3C00,0000,138E          ID[TBER0]_D
U 138E, 0018,0038,0580,0800,0200,11B8          VA_K[.1]
U 11B8, 0000,003D,0180,0800,0000,1242  =0      ERLOOP
U 11B9, 0800,003C,0180,0A18,0000,138F  TBALE1: D_R[3]
U 138F, 0001,003C,0180,09F0,0000,11BA          R[0E]_D
U 11BA, 0000,193D,0180,0A70,0000,1048  =0      LAB_R[0E],D3-0?,CALL,J/TBTAB9
U 11BB, 0800,003C,0180,0A78,0000,1390          D_R[0F]
U 1390, 0003,003C,0180,0AF8,0000,1391          R[0F]_0
U 1391, 0001,003C,0180,0800,0010,1392          ALU_D,CLK.UBCC
U 1392, 0000,013C,0180,0800,0000,11BC          Z?
U 11BC, 0000,003D,0180,0800,0000,1243  =0      ERROR1                      ; NO UTRAP OCCURRED.
U 11BD, 0000,003C,0180,0A18,0010,1393          ALU_R[3],CLK.UBCC
U 1393, 0000,013C,0180,0800,0000,11BE          Z?
U 11BE, 0018,0000,0580,0A98,0000,11BF  =0      R[3]_LA-K[.1]
U 11BF, 0000,003C,0180,0800,0000,11C0          NOP
```

```
                                                .PAGE   "TEST C9        ALIGNMENT UTRAPS TEST 2"
                                        ;*******************************************************************
                                        ;++
                                        ; TEST  C9      ALIGNMENT UTRAPS TEST 2
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF MCT FUNCTIONS WHICH DISABLE ALIGNMENT
                                        ;       ERROR UTRAPS.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                        ;           ERR1
                                        ;               0 = TEST.RCHK
                                        ;               1 = MEM.NOP
                                        ;               2 = TEST.WCHK
                                        ;               3 = WRITE.V.WCHK
                                        ;               4 = WRITE.V.WCHK
                                        ;               5 = READ.V.RCHK
                                        ;               6 = READ.V.RCHK
                                        ;               7 = READ.V.WCHK
                                        ;               8 = READ.V.WCHK
                                        ;               9 = READ.V.NEWPC
                                        ;           ERR2
                                        ;               0 = SBI.HOLD
                                        ;               1 = SBI.HOLD+UNJAM
                                        ;               2 = INVALIDATE
                                        ;               3 = VALIDATE
                                        ;               4 = EXTWRITE.P
                                        ;               5 = WRITE.P
                                        ;               6 = LOCKWRITE.P
                                        ;               7 = READ.P
                                        ;               8 = READ.INT.SUM
                                        ;               9 = LOCKREAD.P
                                        ;               A = ALLOW.IB.READ
                                        ;               B = MCT/17
                                        ;               C = MCT/37
                                        ;
                                        ;--
                                        ;*******************************************************************
                                        =0
U 11C0, 0000,003D,0180,0800,0000,122F   TBALD:  NEWTST
U 11C1, 0018,0038,D980,0A98,0000,11C2           R[3]_K[.9]
U 11C2, 0000,003D,0180,0800,0000,124C   =0      CALL,J/CSOFF
U 11C3, 0F18,0038,0980,0AF0,0000,1394           R[0E]_K[.2],D_0
U 1394, 0000,003C,4980,3C00,0000,1395           ID[TBER0]_D
U 1395, 0018,0038,0580,0800,0200,11C4           VA_K[.1]
U 11C4, 0000,003D,0180,0800,0000,1242   =0      ERLOOP
U 11C5, 0800,003C,0180,0A18,0000,1396   TBALD1: D_R[3]
U 1396, 0001,003C,0180,09F0,0000,11C6           R[0E]_D
U 11C6, 0000,193D,0180,0A70,0000,1020   =0      LAB_R[0E],D3-0?,CALL,J/TBTABA
U 11C7, 0800,003C,0180,0A78,0000,1397           D_R[0F]
U 1397, 0003,003C,0180,0AF8,0000,1398           R[0F]_0
U 1398, 0001,003C,0180,0800,0010,1399           ALU_D,CLK.UBCC
U 1399, 0000,013C,0180,0800,0000,11C8           Z?
U 11C8, 0000,003C,0180,0A18,0010,139A   =0      ALU_R[3],CLK.UBCC,J/TBALD2
```

```
                                          ;3228
                                          ;3229   ;ERR1
U 11C9, 0000,003D,0180,0800,0000,1243     ;3230           ERROR1                  ; UTRAPPED
U 139A, 0000,013C,0180,0800,0000,11CA     ;3231   TBALD2: Z?
U 11CA, 0018,0000,0580,0A98,0000,11C5     ;3232   =0      R[3]_LA-K[.1],J/TBALD1
U 11CB, 0018,0038,8580,0A98,0000,11CC     ;3233           R[3]_K[.C]
U 11CC, 0000,003D,0180,0800,0000,1242     ;3234   =0      ERLOOP
U 11CD, 0800,003C,0180,0A18,0000,139B     ;3235   TBALD3: D_R[3]
U 139B, 0001,003C,0180,09F0,0000,11CE     ;3236           R[0E]_D
U 11CE, 0000,193D,0180,0A70,0000,1010     ;3237   =0      LAB_R[0E],D3-0?,CALL,J/TBTAB2
U 11CF, 0800,003C,0180,0A78,0000,139C     ;3238           D_R[0F]
U 139C, 0003,003C,0180,0AF8,0000,139D     ;3239           R[0F]_0
U 139D, 0001,003C,0180,0800,0010,139E     ;3240           ALU_D,CLK.UBCC
U 139E, 0000,013C,0180,0800,0000,11D0     ;3241           Z?
U 11D0, 0000,003C,0180,0A18,0010,139F     ;3242   =0      ALU_R[3],CLK.UBCC,J/TBALD4
                                          ;3243
                                          ;3244   ;ERR2
U 11D1, 0000,003D,0180,0800,0000,1243     ;3245           ERROR1                  ; UTRAPPED
U 139F, 0000,013C,0180,0800,0000,11D2     ;3246   TBALD4: Z?
U 11D2, 0018,0000,0580,0A98,0000,11CD     ;3247   =0      R[3]_LA-K[.1],J/TBALD3
U 11D3, 0000,003C,0180,0800,0000,11D4     ;3248           NOP
```

```
                                        ;3249           .PAGE   "TEST CA        CROSS PAGE UTRAPS TEST 1"
                                        ;3250   ;*****************************************************************
                                        ;3251   ;++
                                        ;3252   ; TEST  CA      CROSS PAGE UTRAPS TEST 1
                                        ;3253   ;
                                        ;3254   ; TEST DESCRIPTION
                                        ;3255   ;       THIS IS A TEST OF MCT FUNCTIONS WHICH ENABLE CROSS PAGE UTRAPS.
                                        ;3256   ;
                                        ;3257   ; ERROR DESCRIPTION
                                        ;3258   ;       CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                        ;3259   ;               0 = WRITE.V.WCHK
                                        ;3260   ;               1 = READ.V.RCHK
                                        ;3261   ;               2 = READ.V.WCHK
                                        ;3262   ;               3 = READ.V.IBCHK
                                        ;3263   ;
                                        ;3264   ;--
                                        ;3265   ;*****************************************************************
                                        ;3266   =0
U 11D4, 0000,003D,0180,0800,0000,122F   ;3267   TBXPE:  NEWTST
U 11D5, 0018,0038,0D80,0A98,0000,11D6   ;3268           R[3]_K[.3]
U 11D6, 0000,003D,0180,0800,0000,124C   ;3269   =0      CALL,J/CSOFF
U 11D7, 0000,003C,0180,0800,0000,11D8   ;3270           NOP
U 11D8, 0000,003D,0180,0800,0000,12A2   ;3271   =0      CALL,J/TBWPTP
U 11D9, 0018,0038,1980,0800,0200,13A0   ;3272           VA_K[ZERO]
U 13A0, 0000,003C,0180,0900,0000,11DA   ;3273           LC_RC[0]
U 11DA, 0010,0039,0180,0AC0,0000,1074   ;3274   =0      R[8]_LC,CALL,J/TBWRB
U 11DB, 0018,0038,0580,09F8,0000,13A1   ;3275           RC[0F]_K[.1]
U 13A1, 0818,0038,8180,0800,0000,13A2   ;3276           D_K[.3FF]
U 13A2, 0600,003C,0180,0800,0000,13A3   ;3277           D_D.RIGHT,SI/ZERO
U 13A3, 0001,003C,0180,0800,0200,11DC   ;3278           VA_D
U 11DC, 0018,0039,1180,0AF0,0000,1242   ;3279   =0      R[0E]_K[.4],ERLOOP
U 11DD, 0800,003C,0180,0A18,0000,13A4   ;3280   TBXPE1: D_R[3]
U 13A4, 0001,003C,0180,09F0,0000,11DE   ;3281           RC[0E]_D
U 11DE, 0000,193D,0180,0A70,0000,1048   ;3282   =0      LAB_R[0E],D3-0?,CALL,J/TBTAB9
U 11DF, 0800,003C,0180,0A78,0000,13A5   ;3283           D_R[0F]
U 13A5, 0003,003C,0180,0AF8,0000,13A6   ;3284           R[0F]_0
U 13A6, 0001,003C,0180,0800,0010,13A7   ;3285           ALU_D,CLK.UBCC
U 13A7, 0000,013C,0180,0800,0000,11E0   ;3286           Z?
U 11E0, 0000,003D,0180,0800,0000,1243   ;3287   =0      ERROR1                          ; NO UTRAP OCCURRED.
U 11E1, 0000,003C,0180,0A18,0010,13A8   ;3288           ALU_R[3],CLK.UBCC
U 13A8, 0000,013C,0180,0800,0000,11E2   ;3289           Z?
U 11E2, 0018,0000,0580,0A98,0000,11DD   ;3290   =0      R[3]_LA-K[.1],J/TBXPE1
U 11E3, 0000,003C,0180,0800,0000,11E4   ;3291           NOP
```

```
                                        ;3292           .PAGE   "TEST CB        CROSS PAGE UTRAPS TEST 2"
                                        ;3293   ;*****************************************************************
                                        ;3294   ;++
                                        ;3295   ; TEST  CB      CROSS PAGE UTRAPS TEST 2
                                        ;3296   ;
                                        ;3297   ; TEST DESCRIPTION
                                        ;3298   ;       THIS IS A TEST OF MCT FUNCTIONS WHICH DISABLE CROSS PAGE
                                        ;3299   ;       UTRAPS.
                                        ;3300   ;
                                        ;3301   ; ERROR DESCRIPTION
                                        ;3302   ;       CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                        ;3303   ;           ERR1
                                        ;3304   ;               0 = TEST.RCHK
                                        ;3305   ;               1 = MEM.NOP
                                        ;3306   ;               2 = TEST.WCHK
                                        ;3307   ;               3 = WRITE.V.WCHK
                                        ;3308   ;               4 = WRITE.V.WCHK
                                        ;3309   ;               5 = READ.V.RCHK
                                        ;3310   ;               6 = READ.V.RCHK
                                        ;3311   ;               7 = READ.V.WCHK
                                        ;3312   ;               8 = READ.V.WCHK
                                        ;3313   ;               9 = READ.V.NEWPC
                                        ;3314   ;           ERR2
                                        ;3315   ;               0 = SBI.HOLD
                                        ;3316   ;               1 = SBI.HOLD+UNJAM
                                        ;3317   ;               2 = INVALIDATE
                                        ;3318   ;               3 = VALIDATE
                                        ;3319   ;               4 = EXTWRITE.P
                                        ;3320   ;               5 = WRITE.P
                                        ;3321   ;               6 = LOCKWRITE.P
                                        ;3322   ;               7 = READ.P
                                        ;3323   ;               8 = READ.INT.SUM
                                        ;3324   ;               9 = LOCKREAD.P
                                        ;3325   ;               A = ALLOW.IB.READ
                                        ;3326   ;               B = MCT/17
                                        ;3327   ;               C = MCT/37
                                        ;3328   ;
                                        ;3329   ;--
                                        ;3330   ;*****************************************************************
                                        ;3331   =0
U 11E4, 0000,003D,0180,0800,0000,122F   ;3332   TBXPD:  NEWTST
U 11E5, 0018,0038,D980,0A98,0000,11E6   ;3333           R[3]_K[.9]
U 11E6, 0000,003D,0180,0800,0000,124C   ;3334   =0      CALL,J/CSOFF
U 11E7, 0000,003C,0180,0800,0000,11E8   ;3335           NOP
U 11E8, 0000,003D,0180,0800,0000,12A2   ;3336   =0      CALL,J/TBWPTP
U 11E9, 0018,0038,1980,0800,0200,13A9   ;3337           VA_K[ZERO]
U 13A9, 0000,003C,0180,0900,0000,11EA   ;3338           LC_RC[0]
U 11EA, 0010,0039,0180,0AC0,0000,1074   ;3339   =0      R[8]_LC,CALL,J/TBWRB
U 11EB, 0018,0038,0580,09F8,0000,13AA   ;3340           RC[0F]_K[.1]
U 13AA, 0818,0038,8180,0800,0000,13AB   ;3341           D_K[.3FF]
U 13AB, 0600,003C,0180,0800,0000,13AC   ;3342           D_D.RIGHT,SI/ZERO
U 13AC, 0001,003C,0180,0800,0200,11EC   ;3343           VA_D
U 11EC, 0018,0039,1180,0AF0,0000,1242   ;3344   =0      R[0E]_K[.4],ERLOOP
U 11ED, 0800,003C,0180,0A18,0000,13AD   ;3345   TBXPD1: D_R[3]
U 13AD, 0001,003C,0180,09F0,0000,11EE   ;3346           RC[0E]_D
```

```
U 11EE, 0000,193D,0180,0A70,0000,1020   ;3347   =0      LAB_R[OE],D3-0?,CALL,J/TBTABA
U 11EF, 0800,003C,0180,0A78,0000,13AE   ;3348           D_R[OF]
U 13AE, 0003,003C,0180,0AF8,0000,13AF   ;3349           R[OF]_0
U 13AF, 0001,003C,0180,0800,0010,13B0   ;3350           ALU_D,CLK.UBCC
U 13B0, 0000,013C,0180,0800,0000,11F0   ;3351           Z?
U 11F0, 0000,003C,0180,0A18,0010,13B1   ;3352   =0      ALU_R[3],CLK.UBCC,J/TBXPD2
U 11F1, 0000,003D,0180,0800,0000,1243   ;3353           ERROR1                  ; A UTRAP OCCURRED.
U 13B1, 0000,013C,0180,0800,0000,11F2   ;3354   TBXPD2: Z?
U 11F2, 0018,0000,0580,0A98,0000,11ED   ;3355   =0      R[3]_LA-K[.1],J/TBXPD1
U 11F3, 0018,0038,8580,0A98,0000,11F4   ;3356           R[3]_K[.C]
U 11F4, 0000,003D,0180,0800,0000,1242   ;3357   =0      ERLOOP
U 11F5, 0800,003C,0180,0A18,0000,13B2   ;3358   TBXPD3: D_R[3]
U 13B2, 0001,003C,0180,09F0,0000,11F6   ;3359           R[OE]_D
U 11F6, 0000,193D,0180,0A70,0000,1010   ;3360   =0      LAB_R[OE],D3-0?,CALL,J/TBTAB2
U 11F7, 0800,003C,0180,0A78,0000,13B3   ;3361           D_R[OF]
U 13B3, 0003,003C,0180,0AF8,0000,13B4   ;3362           R[OF]_0
U 13B4, 0001,003C,0180,0800,0010,13B5   ;3363           ALU_D,CLK.UBCC
U 13B5, 0000,013C,0180,0800,0000,11F8   ;3364           Z?
U 11F8, 0000,003C,0180,0A18,0010,13B6   ;3365   =0      ALU_R[3],CLK.UBCC,J/TBXPD4
                                        ;3366
                                        ;3367   ;ERR2
U 11F9, 0000,003D,0180,0800,0000,1243   ;3368           ERROR1                  ; A UTRAP OCCURRED.
U 13B6, 0000,013C,0180,0800,0000,11FA   ;3369   TBXPD4: Z?
U 11FA, 0018,0000,0580,0A98,0000,11F5   ;3370   =0      R[3]_LA-K[.1],J/TBXPD3
U 11FB, 0000,003C,0180,0800,0000,1200   ;3371           NOP
```

```
                                          ;3372          .PAGE   "TEST CC        TB PARITY UTRAPS TEST 1"
                                          ;3373   ;***************************************************************
                                          ;3374   ;++
                                          ;3375   ; TEST  CC      TB PARITY UTRAPS TEST 1
                                          ;3376   ;
                                          ;3377   ; TEST DESCRIPTION
                                          ;3378   ;      THIS IS ATEST OF MCT FUNCTIONS WHICH ENABLE TB PARITY ERROR
                                          ;3379   ;      UTRAPS.
                                          ;3380   ;
                                          ;3381   ; ERROR DESCRIPTION
                                          ;3382   ;      CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                          ;3383   ;              0 = TEST.RCHK
                                          ;3384   ;              1 = TEST.WCHK
                                          ;3385   ;              2 = WRITE.V.NOCHK
                                          ;3386   ;              3 = WRITE.V.WCHK
                                          ;3387   ;              4 = LOCKWRITE.V.XCHK
                                          ;3388   ;              5 = READ.V.RCHK
                                          ;3389   ;              6 = READ.V.NOCHK
                                          ;3390   ;              7 = READ.V.WCHK
                                          ;3391   ;              8 = READ.V.IBCHK
                                          ;3392   ;              9 = LOCKREAD.V.NOCHK
                                          ;3393   ;              A = LOCKREAD.V.WCHK
                                          ;3394   ;
                                          ;3395   ;--
                                          ;3396   ;***************************************************************
                                          ;3397   =0
U 1200, 0000,003D,0180,0800,0000,122F     ;3398   TBPRE:  NEWTST
U 1201, 0018,0038,F580,0A98,0000,1202     ;3399           R[3]_K[.A]
U 1202, 0000,003D,0180,0800,0000,124C     ;3400   =0      CALL,J/CSOFF
U 1203, 0018,0038,4180,0AF0,0000,1204     ;3401           R[0E]_K[.80]
U 1204, 0000,003D,0180,0800,0000,12A2     ;3402   =0      CALL,J/TBWPTP
U 1205, 0010,0038,0180,0908,0200,13B7     ;3403           VA_RC[1]
U 13B7, 0000,003C,0180,0900,0000,1206     ;3404           LC_RC[0]
U 1206, 0010,0039,0180,0AC0,0000,1074     ;3405   =0      R[8]_LC,CALL,J/TBWRB
U 1207, 0010,0038,0180,0920,0200,13B8     ;3406           VA_RC[4]
U 13B8, 0000,003C,0180,0918,0000,1208     ;3407           LC_RC[3]
U 1208, 0010,0039,0180,0AC0,0000,1072     ;3408   =0      R[8]_LC,CALL,J/TBWRO
U 1209, 0018,0038,0580,09F8,0000,13B9     ;3409           RC[0F]_K[.1]
U 13B9, 0818,0038,5D80,0800,0000,120A     ;3410           D_K[.7]
U 120A, 0000,003D,4980,3C00,0000,1242     ;3411   =0      ID[TBER0]_D,ERLOOP
U 120B, 0800,003C,0180,0A18,0000,13BA     ;3412   TBPRE1: D_R[3]
U 13BA, 0001,003C,0180,09F0,0000,120C     ;3413           RC[0E]_D
U 120C, 0000,193D,0180,0A70,0000,1030     ;3414   =0      LAB_R[0E],D3-0?,CALL,J/TBTABB
U 120D, 0800,003C,0180,0A78,0000,13BB     ;3415           D_R[0F]
U 13BB, 0003,003C,0180,0AF8,0000,13BC     ;3416           R[0F]_0
U 13BC, 0001,003C,0180,0800,0010,13BD     ;3417           ALU_D,CLK.UBCC
U 13BD, 0000,013C,0180,0800,0000,120E     ;3418           Z?
U 120E, 0000,003D,0180,0800,0000,1243     ;3419   =0      ERROR1                          ; NO UTRAP OCCURRED
U 120F, 0000,003C,0180,0A18,0010,13BE     ;3420           ALU_R[3],CLK.UBCC
U 13BE, 0000,013C,0180,0800,0000,1210     ;3421           Z?
U 1210, 0018,0000,0580,0A98,0000,120B     ;3422   =0      R[3]_LA-K[.1],J/TBPRE1
U 1211, 0F00,003C,0180,0800,0000,13BF     ;3423           D_0
U 13BF, 0000,003C,4980,3C00,0000,1212     ;3424           ID[TBER0]_D
```

```
                                        ;3425           .PAGE   "TEST CD        TB PARITY UTRAPS TEST 2"
                                        ;3426   ;*****************************************************************
                                        ;3427   ;++
                                        ;3428   ; TEST  CD      TB PARITY UTRAPS TEST 2
                                        ;3429   ;
                                        ;3430   ; TEST DESCRIPTION
                                        ;3431   ;       THIS IS A TEST OF MCT FUNCTIONS WHICH DISABLE
                                        ;3432   ;       TB PARITY ERROR UTRAPS.
                                        ;3433   ;
                                        ;3434   ; ERROR DESCRIPTION
                                        ;3435   ;       CODE WHICH IDENTIFIES WHICH MCT FUNCTION WAS BEING TESTED
                                        ;3436   ;           ERR1
                                        ;3437   ;               0 = MEM.NOP
                                        ;3438   ;               1 = READ.V.NEWPC
                                        ;3439   ;           ERR2
                                        ;3440   ;               0 = SBI.HOLD
                                        ;3441   ;               1 = SBI.HOLD+UNJAM
                                        ;3442   ;               2 = INVALIDATE
                                        ;3443   ;               3 = VALIDATE
                                        ;3444   ;               4 = EXTWRITE.P
                                        ;3445   ;               5 = WRITE.P
                                        ;3446   ;               6 = LOCKWRITE.P
                                        ;3447   ;               7 = READ.P
                                        ;3448   ;               8 = READ.INT.SUM
                                        ;3449   ;               9 = LOCKREAD.P
                                        ;3450   ;               A = ALLOW.IB.READ
                                        ;3451   ;               B = MCT/17
                                        ;3452   ;               C = MCT/37
                                        ;3453   ;
                                        ;3454   ;--
                                        ;3455   ;*****************************************************************
                                        ;3456   =0
U 1212, 0000,003D,0180,0800,0000,122F   ;3457   TBPRD:  NEWTST
U 1213, 0018,0038,0580,0A98,0000,1214   ;3458           R[3]_K[.1]
U 1214, 0000,003D,0180,0800,0000,124C   ;3459   =0      CALL,J/CSOFF
U 1215, 0018,0038,4180,0AF0,0000,1216   ;3460           R[0E]_K[.80]
U 1216, 0000,003D,0180,0800,0000,12A2   ;3461   =0      CALL,J/TBWPTP
U 1217, 0010,0038,0180,0908,0200,13C0   ;3462           VA_RC[1]
U 13C0, 0000,003C,0180,0900,0000,1218   ;3463           LC_RC[0]
U 1218, 0010,0039,0180,0AC0,0000,1074   ;3464   =0      R[8]_LC,CALL,J/TBWRB
U 1219, 0010,0038,0180,0920,0200,13C1   ;3465           VA_RC[4]
U 13C1, 0000,003C,0180,0918,0000,121A   ;3466           LC_RC[3]
U 121A, 0010,0039,0180,0AC0,0000,1072   ;3467   =0      R[8]_LC,CALL,J/TBWRO
U 121B, 0018,0038,0580,09F8,0000,13C2   ;3468           RC[0F]_K[.1]
U 13C2, 0818,0038,5D80,0800,0000,121C   ;3469           D_K[.7]
U 121C, 0000,003D,4980,3C00,0000,1242   ;3470   =0      ID[TBER0]_D,ERLOOP
U 121D, 0800,003C,0180,0A18,0000,13C3   ;3471   TBPRD1: D_R[3]
U 13C3, 0001,003C,0180,09F0,0000,121E   ;3472           RC[0E]_D
U 121E, 0000,193D,0180,0A70,0000,10B2   ;3473   =0      LAB_R[0E],D3-0?,CALL,J/TBTABC
U 121F, 0800,003C,0180,0A78,0000,13C4   ;3474           D_R[0F]
U 13C4, 0003,003C,0180,0AF8,0000,13C5   ;3475           R[0F]_0
U 13C5, 0001,003C,0180,0800,0010,13C6   ;3476           ALU_D,CLK.UBCC
U 13C6, 0000,013C,0180,0800,0000,1220   ;3477           Z?
U 1220, 0000,003C,0180,0A18,0010,13C7   ;3478   =0      ALU_R[3],CLK.UBCC,J/TBPRD2
                                        ;3479
```

```
                                           ;3480   ;ERR1
U 1221, 0000,003D,0180,0800,0000,1243     ;3481            ERROR1                  ; A UTRAP OCCURRED.
U 13C7, 0000,013C,0180,0800,0000,1222     ;3482   TBPRD2: Z?
U 1222, 0018,0000,0580,0A98,0000,121D     ;3483   =0       R[3]_LA-K[.1],J/TBPRD1
U 1223, 0018,0038,8580,0A98,0000,1224     ;3484            R[3]_K[.C]
U 1224, 0000,003D,0180,0800,0000,1242     ;3485   =0       ERLOOP
U 1225, 0800,003C,0180,0A18,0000,13C8     ;3486   TBPRD3: D_R[3]
U 13C8, 0001,003C,0180,09F0,0000,1226     ;3487            R[0E]_D
U 1226, 0000,193D,0180,0A70,0000,1010     ;3488   =0       LAB_R[0E],D3-0?,CALL,J/TBTAB2
U 1227, 0800,003C,0180,0A78,0000,13C9     ;3489            D_R[0F]
U 13C9, 0003,003C,0180,0AF8,0000,13CA     ;3490            R[0F]_0
U 13CA, 0001,003C,0180,0800,0010,13CB     ;3491            ALU_D,CLK.UBCC
U 13CB, 0000,013C,0180,0800,0000,1228     ;3492            Z?
U 1228, 0000,003C,0180,0A18,0010,13CC     ;3493   =0       ALU_R[3],CLK.UBCC,J/TBPRD4
                                           ;3494
                                           ;3495   ;ERR2
U 1229, 0000,003D,0180,0800,0000,1243     ;3496            ERROR1                  ; A UTRAP OCCURRED
U 13CC, 0000,013C,0180,0800,0000,122A     ;3497   TBPRD4: Z?
U 122A, 0018,0000,0580,0A98,0000,1225     ;3498   =0       R[3]_LA-K[.1],J/TBPRD3
U 122B, 0000,003C,0180,0800,0000,122C     ;3499            NOP
                                           ;3500   =0
U 122C, 0000,003D,0180,0800,0000,122F     ;3501   DUMMY1: NEWTST
```

```
;                          Location / Line Number Index

;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000           1871:    1838     1845=    1861=    2241=    2242=    2243=    2244=
U 1008           2230=    2231=    2232=    2233=    2234=    2235=    2236=    2237=
U 1010           2250=    2251=    2252=    2253=    2254=    2255=    2256=    2257=
U 1018           2258=    2259=    2260=    2261=    2262=    1839     1862=    1863=
U 1020           2332=    2333=    2334=    2335=    2336=    2337=    2338=    2339=
U 1028           2340=    2341=    1951=    1952=    2288=    2289=    2290=    1840
U 1030           2346=    2347=    2348=    2349=    2350=    2351=    2352=    2353=
U 1038           2354=    2355=    2356=    1841     2307=    2308=    2309=    1842
U 1040           2267=    2268=    2269=    2270=    2271=    1843     1970=    1971=
U 1048           2325=    2326=    2327=    2328=    1972=    1973=    1902:    1844
U 1050           2276=    2277=    2278=    2279=    2280=    2281=    2282=    1864
U 1058           1982=    1983=    1905:    1865     1984=    1985=    1908:    1866
U 1060           2295=    2296=    2297=    2298=    2299=    2300=    2301=    2302=
U 1068           2314=    2315=    2316=    2317=    2318=    2319=    2320=    2321=
U 1070           1986=    1987=    1992=    1993=    1996=    1997=    2006=    2007=
U 1078           2008=    2009=    2025=    2026=    2027=    2028=    2037=    2038=
U 1080           2053=    2054=    2058=    2059=    2075=    2076=    2078=    2079=
U 1088           2083=    2084=    2111=    2112=    2114=    2115=    2117=    2118=
U 1090           2121=    2122=    2124=    2125=    2127=    2128=    2131=    2132=
U 1098           2135=    2136=    2175=    2176=    2180=    2181=    2183=    2184=
U 10A0           2185=    2186=    2190=    2191=    2193=    2194=    2195=    2196=
U 10A8           2200=    2201=    2203=    2204=    2205=    2206=    2210=    2211=
U 10B0           2213=    2214=    2361=    2362=    2381=    2382=    2383=    2384=
U 10B8           2387=    2388=    2396=    2397=    2398=    2399=    2412=    2413=
U 10C0           2416=    2417=    2423=    2424=    2425=    2426=    2439=    2440=
U 10C8           2443=    2444=    2468=    2469=    2470=    2471=    2474=    2475=
U 10D0           2483=    2484=    2485=    2486=    2498=    2499=    2502=    2503=
U 10D8           2510=    2511=    2512=    2513=    2526=    2527=    2530=    2531=
U 10E0           2538=    2539=    2540=    2541=    2554=    2555=    2558=    2559=
U 10E8           2566=    2567=    2568=    2569=    2582=    2583=    2586=    2587=
U 10F0           2594=    2595=    2596=    2597=    2611=    2612=    2615=    2616=
U 10F8           2623=    2624=    2625=    2626=    2639=    2640=    2643=    2644=
U 1100           1825:    1826:    1827:    1828:    1829:    1830:    1831:    1832:
U 1108           1833:    1867     2668=    2669=    1834:    1835:    1836:    1837:
U 1110           2670=    2671=    2672=    2673=    2676=    2677=    2678=    2679=
U 1118           2681=    2682=    2686=    2687=    2689=    2690=    2725=    2726=
U 1120           2727=    2728=    2729=    2730=    2733=    2734=    2735=    2736=
U 1128           2738=    2739=    2743=    2746=    2748=    2749=    2750=    2751=
U 1130           2753=    2754=    2758=    2761=    2763=    2764=    2786=    2787=
U 1138           2788=    2789=    2790=    2791=    2794=    2795=    2796=    2797=
U 1140           2799=    2800=    2804=    2805=    2807=    2808=    2847=    2848=
U 1148           2849=    2850=    2851=    2852=    2855=    2856=    2857=    2858=
U 1150           2860=    2861=    2865=    2868=    1868     1928:    2870=    2871=
U 1158           2872=    2873=    2875=    2876=    2880=    2883=    2885=    2886=
U 1160           2907=    2908=    2909=    2910=    2911=    2912=    2918=    2919=
U 1168           2920=    2921=    2923=    2924=    2928=    2929=    2931=    2932=
U 1170           2972=    2973=    2974=    2975=    2976=    2977=    2983=    2984=
U 1178           2985=    2986=    2988=    2989=    2219:    2220:    2221:    2222:
U 1180           2993=    2996=    2998=    2999=    3000=    3001=    3003=    3004=
U 1188           3008=    3011=    3013=    3014=    3033=    3034=    3035=    3036=
U 1190           3037=    3038=    3042=    3043=    3044=    3045=    3047=    3048=
U 1198           3052=    3053=    3055=    3056=    3095=    3096=    3097=    3098=
;Location         0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 11A0            3099=    3100=    3104=    3105=    3106=    3107=    3109=    3110=
U 11A8            3114=    3117=    3119=    3120=    3121=    3122=    3124=    3125=
U 11B0            3129=    3132=    3134=    3135=    3154=    3155=    3156=    3157=
U 11B8            3160=    3161=    3163=    3164=    3168=    3169=    3171=    3172=
U 11C0            3213=    3214=    3215=    3216=    3219=    3220=    3222=    3223=
U 11C8            3227=    3230=    3232=    3233=    3234=    3235=    3237=    3238=
U 11D0            3242=    3245=    3247=    3248=    3267=    3268=    3269=    3270=
U 11D8            3271=    3272=    3274=    3275=    3279=    3280=    3282=    3283=
U 11E0            3287=    3288=    3290=    3291=    3332=    3333=    3334=    3335=
U 11E8            3336=    3337=    3339=    3340=    3344=    3345=    3347=    3348=
U 11F0            3352=    3353=    3355=    3356=    3357=    3358=    3360=    3361=
U 11F8            3365=    3368=    3370=    3371=    2223:    2224:    2225:    2226:
U 1200            3398=    3399=    3400=    3401=    3402=    3403=    3405=    3406=
U 1208            3408=    3409=    3411=    3412=    3414=    3415=    3419=    3420=
U 1210            3422=    3423=    3457=    3458=    3459=    3460=    3461=    3462=
U 1218            3464=    3465=    3467=    3468=    3470=    3471=    3473=    3474=
U 1220            3478=    3481=    3483=    3484=    3485=    3486=    3488=    3489=
U 1228            3493=    3496=    3498=    3499=    3501=    1869     1870     1880
U 1230            1881     1882     1883     1884     1885     1886     1887     1888
U 1238            1889     1890     1891     1892     1893     1894     1895     1896
U 1240            1897     1898     1899     1900     1901     1903     1904     1936
U 1248            1937     1943     1944     1945     1950     1953     1954     1957
U 1250            1958     1959     1960     1963     1964     1965     1988     1989
U 1258            1999     2010     2011     2012     2018     2019     2020     2021
U 1260            2022     2023     2024     2029     2030     2031     2032     2033
U 1268            2034     2035     2036     2039     2040     2045     2046     2047
U 1270            2048     2049     2050     2051     2052     2055     2056     2057
U 1278            2066     2067     2068     2069     2070     2071     2072     2073
U 1280            2074     2077     2080     2081     2082     2086     2088     2089
U 1288            2090     2091     2092     2093     2094     2095     2096     2097
U 1290            2098     2099     2100     2101     2102     2103     2104     2105
U 1298            2106     2107     2108     2109     2113     2119     2123     2129
U 12A0            2133     2137     2163     2164     2165     2166     2167     2168
U 12A8            2169     2170     1929:    2171     2172     2173     2174     2177
U 12B0            2178     2179     2182     2187     2188     2189     2192     2197
U 12B8            2198     2199     2202     2207     2208     2209     2212     2218
U 12C0            2385     2386     2389     2390     2400     2401     2402     2403
U 12C8            2404     2405     2406     2407     2408     2409     2410     2411
U 12D0            2414     2415     2427     2428     2429     2430     2431     2432
U 12D8            2433     2434     2435     2436     2437     2438     2441     2442
U 12E0            2472     2473     2476     2477     2487     2488     2489     2490
U 12E8            2491     2492     2493     2494     2495     2496     2497     2500
U 12F0            2501     2514     2515     2516     2517     2518     2519     2520
U 12F8            2521     2522     2523     2524     2525     2528     2529     2542
U 1300            2543     2544     2545     2546     2547     2548     2549     2550
U 1308            2551     2552     2553     2556     2557     2570     2571     2572
U 1310            2573     2574     2575     2576     2577     2578     2579     2580
U 1318            2581     2584     2585     2598     2599     2600     2601     2602
U 1320            2603     2604     2605     2606     2607     2608     2609     2610
U 1328            2613     2614     2627     2628     2629     2630     2631     2632
U 1330            2633     2634     2635     2636     2637     2638     2641     2642
U 1338            2645     2674     2675     2680     2683     2684     2685     2688
U 1340            2731     2732     2737     2740     2741     2742     2747     2752
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348           2755    2756    2757    2762    2792    2793    2798    2801
U 1350           2802    2803    2806    2853    2854    2859    2862    2863
U 1358           2864    2869    2874    2877    2878    2879    2884    2913
U 1360           2914    2915    2916    2917    2922    2925    2926    2927
U 1368           2930    2978    2979    2980    2981    2982    2987    2990
U 1370           2991    2992    2997    3002    3005    3006    3007    3012
U 1378           3039    3040    3041    3046    3049    3050    3051    3054
U 1380           3101    3102    3103    3108    3111    3112    3113    3118
U 1388           3123    3126    3127    3128    3133    3158    3159    3162
U 1390           3165    3166    3167    3170    3217    3218    3221    3224
U 1398           3225    3226    3231    3236    3239    3240    3241    3246
U 13A0           3273    3276    3277    3278    3281    3284    3285    3286
U 13A8           3289    3338    3341    3342    3343    3346    3349    3350
U 13B0           3351    3354    3359    3362    3363    3364    3369    3404
U 13B8           3407    3410    3413    3416    3417    3418    3421    3424
U 13C0           3463    3466    3469    3472    3475    3476    3477    3482
U 13C8           3487    3490    3491    3492    3497
U 13D0 - 13EF Unused
U 13F0           1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8           1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH2C        989

Used             989
Remaining

Total microwords used in memory U: 989
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

Z
E
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U

```
; The files used in this assembly are:
ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH2C.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3      Control ROM Field Definitions
; 548    Register Transfer Macro Definitions
; 1413   Non-transfer Functions
; 1485   Branch Enable Macro Definitions
; 1564   MICRO DIAGNOSTIC DEFINED MACROS
; 1806   MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2159   TEST CE CACHE WRITE PULSE LOGIC TEST
; 2745   TEST CF ADDRESS BIT 2 IN GROUP 0 TEST
; 2844   TEST D0 ADDRESS BIT 2 IN GROUP 1 TEST
; 2943   TEST D1 DATA PATH TO GROUP 0 TEST
; 3054   TEST D2 DATA PATH TO GROUP 1 TEST
; 3165   TEST D3 ADDRESS PATH TO GROUP 0 TAG MEMORY TEST
; 3279   TEST D4 ADDRESS PATH TO GROUP 1 TAG MEMORY TEST
; 3395   TEST D5 GROUP 0 HIT/MISS COMPARATORS TEST
```

```
;1      .NOLIST
;1804   .LIST
;1805
```

```
                                        ;1806           .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                        ;1807   .REGION/1000,13FF
                                        ;1808   ;+
                                        ;1809   ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                        ;1810   ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                        ;1811   ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                        ;1812   ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                        ;1813   ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                        ;1814   ;
                                        ;1815   ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                        ;1816   ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                        ;1817   ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                        ;1818   ;       R[OF] AND DO A RETURN0.
                                        ;1819   ;
                                        ;1820   ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                        ;1821   ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                        ;1822   ; TO THE CONSOLE.
                                        ;1823   ;
                                        ;1824   ;-
U 1100, 0000,003C,1980,0800,0084,7003   ;1825   1100:   SC_K[ZERO],J/TRPH1      ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001   ;1826   1101:   SC_K[.1],J/TRPH0        ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001   ;1827   1102:   SC_K[.2],J/TRPH0        ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001   ;1828   1103:   SC_K[.3],J/TRPH0        ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001   ;1829   1104:   SC_K[.4],J/TRPH0        ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001   ;1830   1105:   SC_K[.6],J/TRPH0        ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001   ;1831   1106:   SC_K[.9],J/TRPH0        ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001   ;1832   1107:   SC_K[.7],J/TRPH0        ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001   ;1833   1108:   SC_K[.8],J/TRPH0        ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003   ;1834   110C:   SC_K[.C],J/TRPH1        ; RDS
U 110D, 0000,003C,8980,0800,0084,7003   ;1835   110D:   SC_K[.D],J/TRPH1        ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001   ;1836   110E:   SC_K[.10],J/TRPH0       ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003   ;1837   110F:   SC_K[.F],J/TRPH1        ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,102B   ;1838   TRPH0:  Q_ID[USTACK]
U 102B, 0C00,003C,01E0,0800,0000,1037   ;1839           Q_D,D_Q
U 1037, 0000,003C,8180,3C00,0000,104F   ;1840           ID[USTACK]_D
U 104F, 0C00,003C,01E0,0800,0000,105B   ;1841           Q_D,D_Q
U 105B, 0000,003C,01C0,0A78,0000,105F   ;1842           Q_R[OF]
U 105F, 0001,2024,0180,0800,0010,1097   ;1843           A[U_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 1097, 0000,013C,0180,0800,0000,1002   ;1844           Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000   ;1845   =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
                                        ;1846   ;+
                                        ;1847   ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                        ;1848   ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                        ;1849   ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                        ;1850   ;
                                        ;1851   ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                        ;1852   ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                        ;1853   ;             FAULT STATUS REGISTER
                                        ;1854   ;             SBI ERROR REGISTER
                                        ;1855   ;             TIMEOUT ADDRESS REGISTER
                                        ;1856   ;             MAINTENANCE REGISTER
                                        ;1857   ;             CACHE PARITY REGISTER
                                        ;1858   ;             TB ERROR REGISTER 1
                                        ;1859   ;             TB ERROR REGISTER 0
                                        ;1860   ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,104C   TRPH1:  RC[0D]_SC
U 104C, 0000,003D,D980,0800,0084,724D   =0      SETRCF[.9]
U 104D, 0000,003C,49F0,2C00,0000,109F           Q_ID[TBER0]
U 109F, 0001,203C,4DF0,2DB0,0000,10AB           RC[6]_Q,Q_ID[TBER1]
U 10AB, 0001,203C,65F0,2DB8,0000,10B3           RC[7]_Q,Q_ID[SBI.ERR]
U 10B3, 0001,203C,6DF0,2DD8,0000,1109           RC[0B]_Q,Q_ID[FAULT]
U 1109, 0001,203C,75F0,2DE0,0000,1154           RC[0C]_Q,Q_ID[MAINT]
U 1154, 0001,203C,79F0,2DC8,0000,1231           RC[9]_Q,Q_ID[PARITY]
U 1231, 0001,203C,69F0,2DC0,0000,1232           RC[8]_Q,Q_ID[TIME.ADDR]
U 1232, 0001,203C,81F0,2DD0,0000,1000           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1247   1000:   RC[0E]_Q,ERROR1
                                        ;+
                                        ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;               NEWTST
                                        ;               ERLOOP
                                        ;               ERROR1
                                        ;               ERROR2
                                        ;
U 1233, 0000,003C,65F8,0800,0084,7234   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 1234, 0818,0038,8D80,0800,0000,1235           D_K[.1F]                        ; ...
U 1235, 0D00,003C,0180,0800,0000,1236           D_DAL.SC
U 1236, 0000,003C,3D80,3C00,0000,1237           ID[PSL]_D                       ; WRITE THE PSL
U 1237, 0818,0038,0580,0800,0000,1238           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 1238, 0D00,003C,0180,0800,0000,1239           D_DAL.SC
U 1239, 0F00,003C,3180,3C00,0000,123A           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 123A, 0000,003C,5D80,3C00,0000,123B           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 123B, 0000,003C,3980,3C00,0000,123C           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 123C, 0000,003C,2980,3C00,0000,123D           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 123D, 0000,003C,4980,3C00,0000,123E           ID[TBER0]_D                     ; SHUT OFF THE TB
U 123E, 0818,0038,C180,0800,0000,123F           D_K[.FFFF]
U 123F, 0000,003C,6580,3C00,0000,1240           ID[SBI.ERR]_D
U 1240, 0F00,003C,6D80,3C00,0000,1241           ID[FAULT]_D,D_0
U 1241, 0000,003C,6D80,3C00,0000,1242           ID[FAULT]_D
U 1242, 0000,003C,6580,3C00,0000,1243           ID[SBI.ERR]_D
U 1243, 0003,003C,0180,09F0,0000,1244           RC[0E]_0
U 1244, 0003,003C,0180,0AF8,0000,1245           R[0F]_0
U 1245, 0003,003C,0180,09E8,0000,105E           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 1246, 0818,0038,0980,0800,0000,105E   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 1247, 0810,0038,0180,0978,0000,1248   ERROR1: D_RC[0F]
U 1248, 0819,0034,4D80,0800,0000,104E           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   104E:   D_D.OR.K[.4],J/CALLCON
U 1249, 0810,0038,0180,0978,0000,124A   ERROR2: D_RC[0F]
U 124A, 0819,0034,4D80,0800,0000,105A           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   105A:   D_D.OR.K[.6],J/CALLCON
                                        105E:
                                        CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;+
                                        ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;-
U 13F0, 0000,003C,0180,0800,0000,13F1   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,124B   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 124B, 0810,0038,4D80,0978,0000,124C   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 124C, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 124D, 0010,0038,01C0,0978,0000,124E   ;1943   SETRCF: Q_RC[OF]
U 124E, 0019,2034,4DC0,0800,0000,124F   ;1944           Q_Q.AND.K[.FF00]
U 124F, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946
                                        ;1947   ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                        ;1948   ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                        ;1949   ; CERTAIN TRAPS.
U 1250, 0018,0038,C180,0800,0000,1058   ;1950   DC.1DE: ALU_K[.FFFF]
U 1058, 0500,003D,0380,0800,0000,1262   ;1951   =0      D_D.LEFT,SI/7,CALL,J/DCD
U 1059, 0000,003C,0180,0800,0000,1263   ;1952           J/DCE
                                        ;1953   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 1251, 0116,0038,1B80,0800,0000,1265   ;1954   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 1252, 0118,0038,0B80,0800,0000,1265   ;1955   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1253, 0118,0038,0780,0800,0000,1265   ;1956   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 1254, 0118,0038,C380,0800,0000,1265   ;1957   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 1255, 0018,0038,1980,0800,0000,1251   ;1958   DC0:    ALU_0(K),J/S00
U 1256, 0018,0038,1980,0800,0000,1252   ;1959   DC1:    ALU_0(K),J/S01
U 1257, 0018,0038,1980,0800,0000,1253   ;1960   DC2:    ALU_0(K),J/S10
U 1258, 0018,0038,1980,0800,0000,1254   ;1961   DC3:    ALU_0(K),J/S11
U 1259, 0018,0038,0980,0800,0000,1251   ;1962   DC4:    ALU_K[.2],J/S00
U 125A, 0018,0038,0980,0800,0000,1252   ;1963   DC5:    ALU_K[.2],J/S01
U 125B, 0018,0038,0980,0800,0000,1253   ;1964   DC6:    ALU_K[.2],J/S10
U 125C, 0018,0038,0980,0800,0000,1254   ;1965   DC7:    ALU_K[.2],J/S11
U 125D, 0018,0038,0580,0800,0000,1251   ;1966   DC8:    ALU_K[.1],J/S00
U 125E, 0018,0038,0580,0800,0000,1252   ;1967   DC9:    ALU_K[.1],J/S01
U 125F, 0018,0038,0580,0800,0000,1253   ;1968   DCA:    ALU_K[.1],J/S10
U 1260, 0018,0038,0580,0800,0000,1254   ;1969   DCB:    ALU_K[.1],J/S11
U 1261, 0018,0038,C180,0800,0000,1251   ;1970   DCC:    ALU_K[.FFFF],J/S00
```

```
U 1262, 0018,0038,C180,0800,0000,1252   ;1971   DCD:    ALU_K[.FFFF],J/S01
U 1263, 0018,0038,C180,0800,0000,1253   ;1972   DCE:    ALU_K[.FFFF],J/S10
U 1264, 0018,0038,C180,0800,0000,1254   ;1973   DCF:    ALU_K[.FFFF],J/S11
U 1265, 0100,003E,0380,0800,0000,0001   ;1974   SX:     D_D.LEFT2,SI/7,RETURN1
U 1266, 0018,0038,01C0,0800,0000,105C   ;1975   DC.5:   Q_K[.8]
                                        ;1976   =0
U 105C, 0000,003D,0180,0800,0000,125A   ;1977   DC.5A:  CALL,J/DC5
U 105D, 0019,2000,05C0,0800,0010,1267   ;1978           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1267, 0000,013C,0180,0800,0000,10F8   ;1979           Z?
U 10F8, 0000,003C,0180,0800,0000,105C   ;1980   =0      J/DC.5A
U 10F9, 0000,003E,0180,0800,0000,0001   ;1981           RETURN1
                                        ;1982   =0
U 10FA, 0000,003D,0180,0800,0000,1266   ;1983   DC.A:   CALL,J/DC.5
U 10FB, 0500,003E,0180,0800,0000,0001   ;1984           D_D.LEFT,SI/ZERO,RETURN1
U 1268, 0018,0038,01C0,0800,0000,10FC   ;1985   DC.9:   Q_K[.8]
                                        ;1986   =0
U 10FC, 0000,003D,0180,0800,0000,125E   ;1987   DC.9A:  CALL,J/DC9
U 10FD, 0019,2000,05C0,0800,0010,1269   ;1988           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1269, 0000,013C,0180,0800,0000,10FE   ;1989           Z?
U 10FE, 0000,003C,0180,0800,0000,10FC   ;1990   =0      J/DC.9A
U 10FF, 0000,003E,0180,0800,0000,0001   ;1991           RETURN1
                                        ;1992   =0
U 110A, 0000,003D,0180,0800,0000,1268   ;1993   DC.C:   CALL,J/DC.9
U 110B, 0018,0038,C180,0800,0000,126A   ;1994           ALU_K[.FFFF]
U 126A, 0600,003E,0380,0800,0000,0001   ;1995           D_D.RIGHT,SI/7,RETURN1
                                        ;1996   =0
U 1110, 0000,003D,0180,0800,0000,1268   ;1997   DC.6:   CALL,J/DC.9
U 1111, 0018,0038,0580,0800,0000,126B   ;1998           ALU_K[.1]
U 126B, 0100,003E,0380,0800,0000,0001   ;1999           D_D.LEFT2,SI/7,RETURN1
                                        ;2000   =0
U 1112, 0000,003D,0180,0800,0000,1268   ;2001   DC.3:   CALL,J/DC.9
U 1113, 0018,0038,C180,0800,0000,126C   ;2002           ALU_K[.FFFF]
U 126C, 0500,003E,0380,0800,0000,0001   ;2003           D_D.LEFT,SI/7,RETURN1
                                        ;2004   ; THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAAA IN THE D REGISTER.
U 126D, 0F18,0038,5DC0,0800,0000,1114   ;2005   DCLA:   D_0,Q_K[.7]
                                        ;2006   =0
U 1114, 0000,003D,0180,0800,0000,125F   ;2007   DCLA1:  CALL,J/DCA
U 1115, 0001,203C,0180,0800,0010,126E   ;2008           ALU_Q,CLK.UBCC
U 126E, 0000,013C,0180,0800,0000,1116   ;2009           Z?
U 1116, 0019,2000,05C0,0800,0000,1114   ;2010   =0      Q_Q-K[.1],J/DCLA1
U 1117, 0000,003E,0180,0800,0000,0001   ;2011           RETURN1
                                        ;2012   ; THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
                                        ;2013   ; THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
                                        ;2014   ; IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED, IF NO
                                        ;2015   ; UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
                                        ;2016   ; IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
                                        ;2017   ; TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
                                        ;2018   ; WILL CONTAIN THE READ DATA.
                                        ;2019   =0
U 1118, 0F00,003D,0180,0800,0000,125B   ;2020   RHOH1:  D_0,CALL,J/DC6
U 1119, 0000,003C,0180,0800,0000,111F   ;2021           J/READ
                                        ;2022   =0
U 111A, 0F00,003D,0180,0800,0000,1257   ;2023   RHOM1:  D_0,CALL,J/DC2
U 111B, 0000,003C,0180,0800,0000,111F   ;2024           J/READ
                                        ;2025   =0
```

```
U 111C, 0F00,003D,0180,08C0,0000,1259     ;2026   RMOH1:  D_0,CALL,J/DC4
U 111D, 0000,003C,0180,0800,0000,111F     ;2027           J7READ
                                          ;2028   =0
U 111E, 0F00,003C,0180,0800,0000,111F     ;2029   RMOM1:  D_0,J/READ
U 111F, 0000,003C,01F8,0800,0084,726F     ;2030   READ:   SC_K[.8],Q_0              ; CALCULATE THE EXPECTED HIT/MISS BITS
U 126F, 0D00,003C,0180,0800,0000,1270     ;2031           D_DAL.SC
U 1270, 0001,003C,0180,09E8,0000,1271     ;2032           RC[0D]_D
U 1271, 0818,0038,6180,0800,0084,7272     ;2033           D_K[.F],SC_K[.F]          ; CALCULATE THE EXPECTED FORCE MISS
U 1272, 0000,003C,09F8,0800,0084,B273     ;2034           SC_SC-K[.2],Q_0           ; AND THE EXPECTED FORCE REPLACE BITS
U 1273, 0D00,003C,75F0,2C00,0000,1274     ;2035           D_DAL.SC,Q_ID[MAINT]
U 1274, 001D,0034,01C0,0800,0000,1275     ;2036           ALU_D[AND]Q,Q_ALU
U 1275, 0810,0038,0180,0968,0000,1276     ;2037           D_RC[0D]
U 1276, 001D,0030,0180,09E8,0000,1277     ;2038           ALU_D[OR]Q,RC[0D]_ALU
U 1277, 0000,003C,0180,0A70,0000,1278     ;2039           LAB_R[0E]
U 1278, 0000,003C,0180,52F8,0000,1279     ;2040           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK
U 1279, 0001,003C,0180,09D0,0000,127A     ;2041           RC[0A]_D
U 127A, 0000,003C,75F0,2C00,0000,127B     ;2042           Q_ID[MAINT]
U 127B, 0800,003C,0180,0A78,0000,127C     ;2043           D_R[0F]
U 127C, 0003,003C,0180,0AF8,0000,127D     ;2044           R[0F]_0
U 127D, 0001,203C,0180,09E0,0000,127E     ;2045           RC[0C]_Q
U 127E, 0000,003C,01C0,0A70,0000,127F     ;2046           Q_R[0E]
U 127F, 0001,003C,0180,09C8,0000,1280     ;2047           RC[9]_D
U 1280, 001D,2000,0180,0800,0010,1281     ;2048           ALU_Q-D,CLK.UBCC
U 1281, 0000,013C,0180,0800,0000,1120     ;2049           Z?
U 1120, 0000,003C,0180,0800,0000,1289     ;2050   =0      J/RERR
U 1121, 0818,0038,D5F8,0800,0000,1282     ;2051           Q_0,D_K[.6]
U 1282, 0000,003C,0180,0800,0084,7283     ;2052           SC_K[.8]
U 1283, 0D10,0038,01C0,0960,0000,1284     ;2053           D_DAL.SC,Q_RC[0C]
U 1284, 001D,2034,01C0,0800,0000,1285     ;2054           ALU_Q[AND]D,Q_ALU
U 1285, 0810,0038,0180,0968,0000,1286     ;2055           D_RC[0D]
U 1286, 0819,0034,9180,0800,0000,1287     ;2056           ALU_D[AND]K[.1F00],D_ALU  ; AND OUT EVERYTHING BUT HIT MISS BITS
U 1287, 001D,2000,0180,0800,0010,1288     ;2057           ALU_Q-D,CLK.UBCC
U 1288, 0010,0138,01C0,0958,0000,1122     ;2058           Z?,Q_RC[0B]
U 1122, 0000,003E,0180,0800,0000,0002     ;2059   =0      RETURN2
U 1123, 0810,003A,0180,0950,0000,0003     ;2060           D_RC[0A],RETURN3
U 1289, 0000,003C,79F0,2C00,0000,128A     ;2061   RERR:   Q_ID[PARITY]
U 128A, 0001,203E,0180,09E8,0000,0001     ;2062           RC[0D]_Q,RETURN1
                                          ;2063   ; THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
                                          ;2064   ; AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
                                          ;2065   ; ELSE RETURN2.
U 128B, 0000,003C,0180,0A70,0000,128C     ;2066   WRITE:  LAB_R[0E]
U 128C, 0000,003C,0180,32F8,0000,128D     ;2067           R[0F]_LA,FS/MCT,MCT/WRITE.V.WCHK
U 128D, 0800,003C,0180,0A78,0000,128E     ;2068           D_R[0F]
U 128E, 0003,003C,0180,0AF8,0000,128F     ;2069           R[0F]_0
U 128F, 0000,003C,01C0,0A70,0000,1290     ;2070           Q_R[0E]
U 1290, 001D,2000,0180,0800,0010,1291     ;2071           ALU_Q-D,CLK.UBCC
U 1291, 0000,013C,0180,0800,0000,1124     ;2072           Z?
U 1124, 0000,003C,0180,0800,0000,1289     ;2073   =0      J/RERR                    ; UTRAPPED.
U 1125, 0000,003E,0180,0800,0000,0002     ;2074           RETURN2                   ; OK NO UTRAP.
                                          ;2075   ; THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
                                          ;2076   ; REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
                                          ;2077   ; CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
                                          ;2078   ; NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
                                          ;2079   ; DISSABLE SBI CYCLES:
U 1292, 0F00,003C,0180,0800,0000,1293     ;2080   SOFF:   D_0
```

```
U 1293, 0000,003C,8580,0800,0084,7294   ;2081   S1:     SC_K[.C]
U 1294, 0801,001C,0180,0800,0000,1295   ;2082           ALU_D.ORNOT.MASK,D_ALU
U 1295, 0000,003E,7580,3C00,0000,0001   ;2083           ID[MAINT]_D,RETURN
                                        ;2084   ; SET FORCE REPLACE GROUP ZERO BIT
U 1296, 0F00,003C,0180,0800,0000,1297   ;2085   R0S:    D_0
U 1297, 0000,003C,6180,0800,0084,7298   ;2086   S2:     SC_K[.F]
U 1298, 0000,003C,0580,0800,0084,B299   ;2087           SC_SC-K[.1]
U 1299, 0801,001C,0180,0800,0000,1293   ;2088   S3:     ALU_D.ORNOT.MASK,D_ALU,J/S1
                                        ;2089   ; SET FORCE REPLACE GROUP 1 BIT
U 129A, 0F00,003C,0180,0800,0000,129B   ;2090   R1S:    D_0
U 129B, 0000,003C,8980,0800,0084,7299   ;2091   S4:     SC_K[.D],J/S3
                                        ;2092   ; SET FORCE MISS GROUP 0 BIT
U 129C, 0F00,003C,0180,0800,0000,129D   ;2093   M0S:    D_0
U 129D, 0000,003C,6580,0800,0084,7299   ;2094   S5:     SC_K[.10],J/S3
                                        ;2095   ; SET FORCE MISS GROUP 1 BIT
U 129E, 0F00,003C,0180,0800,0000,129F   ;2096   M1S:    D_0
U 129F, 0000,003C,6180,0800,0084,7299   ;2097   S6:     SC_K[.F],J/S3
                                        ;2098   ; SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
U 12A0, 0F00,003C,0180,0800,0000,12A1   ;2099   M10S:   D_0
U 12A1, 0000,003C,6180,0800,0084,72A2   ;2100           SC_K[.F]
U 12A2, 0801,001C,0180,0800,0000,129D   ;2101   S7:     ALU_D.ORNOT.MASK,D_ALU,J/S5
                                        ;2102   ; SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
U 12A3, 0F00,003C,0180,0800,0000,12A4   ;2103   R0M1S:  D_0
U 12A4, 0000,003C,6180,0800,0084,72A5   ;2104           SC_K[.F]
U 12A5, 0801,001C,0180,0800,0000,1297   ;2105           ALU_D.ORNOT.MASK,D_ALU,J/S2
                                        ;2106   ; SET FORCE REPLACE GROUP 1 FORCE MISS GROUP 0 BITS
U 12A6, 0F00,003C,8980,0800,0084,72A2   ;2107   R1M0S:  D_0,SC_K[.D],J/S7
                                        ;2108   ; THIS SUBROUTINE IS CALLED TO GENERATE SOME BASIC DATA AND ADDRESS
                                        ;2109   ; PATTERNS WHICH ARE USED BY MANY OF THE CACHE TESTS. IT LEAVES
                                        ;2110   ; THESE PATTERNS IN THE RC SCRATCH PADS.
                                        ;2111   ;       RC[0]           AAAAAAAA
                                        ;2112   ;       RC[1]           19999000
                                        ;2113   ;       RC[2]           55555555
                                        ;2114   ;       RC[3]           06666000
                                        ;2115   ;       RC[4]           99999999
                                        ;2116   ;       RC[5]           1B6DB000
                                        ;2117   ;       RC[6]           66666666
                                        ;2118   ;       RC[7]           04924000
U 12A7, 0F18,0038,5DC0,0800,0000,1126   ;2119   CAPAT:  Q_K[.7],D_0
                                        ;2120   =0
U 1126, 0000,003D,0180,0800,0000,125F   ;2121   CAP1:   CALL,J/DCA
U 1127, 0001,203C,0180,0800,0010,12A8   ;2122           ALU_Q,CLK.UBCC
U 12A8, 0000,013C,0180,0800,0000,1128   ;2123           Z?
U 1128, 0019,2000,05C0,0800,0000,1126   ;2124   =0      Q_Q-K[.1],J/CAP1
U 1129, 0001,003C,0180,0980,0000,12A9   ;2125           RC[0]_D
U 12A9, 0001,0028,0180,0990,0000,12AB   ;2126           ALU_NOT.D,RC[2]_ALU
U 12AB, 0F18,0038,5DC0,0800,0000,112A   ;2127           Q_K[.7],D_0
                                        ;2128   =0
U 112A, 0000,003D,0180,0800,0000,125E   ;2129   CAP2:   CALL,J/DC9
U 112B, 0001,203C,0180,0800,0010,12AC   ;2130           ALU_Q,CLK.UBCC
U 12AC, 0000,013C,0180,0800,0000,112C   ;2131           Z?
U 112C, 0019,2000,05C0,0800,0000,112A   ;2132   =0      Q_Q-K[.1],J/CAP2
U 112D, 0001,003C,0180,09A0,0000,12AD   ;2133           RC[4]_D
U 12AD, 0001,0028,0180,09B0,0000,12AE   ;2134           ALU_NOT.D,RC[6]_ALU
U 12AE, 0000,003C,89F8,0800,0084,72AF   ;2135           Q_0,SC_K[.D]
```

```
U 12AF, 0D00,003C,0180,0800,0000,12B0   ;2136              D_DAL.SC
U 12B0, 0600,003C,0180,0800,0000,12B1   ;2137              D_D.RIGHT,SI/ZERO
U 12B1, 0001,003C,0180,0988,0000,12B2   ;2138              RC[1]_D
U 12B2, 0810,0038,65F8,0930,0084,72B3   ;2139              D_RC[6],SC_K[.10],Q_0
U 12B3, 0D00,003C,0180,0800,0000,12B4   ;2140              D_DAL.SC
U 12B4, 0200,003C,0180,0800,0000,12B5   ;2141              D_D.RIGHT2,SI/ZERO
U 12B5, 0200,003C,0180,0800,0000,12B6   ;2142              D_D.RIGHT2,SI/ZERO
U 12B6, 0F01,003C,0180,0998,0000,112E   ;2143              RC[3]_D,D_0
U 112E, 0000,003D,0180,0800,0000,125E   ;2144      =0      CALL,J/DC9
U 112F, 0100,003C,0180,0800,0000,1130   ;2145              D_D.LEFT2,SI/ZERO
U 1130, 0000,003D,0180,0800,0000,125E   ;2146      =0      CALL,J/DC9
U 1131, 0500,003C,0180,0800,0000,1132   ;2147              D_D.LEFT,SI/ZERO
U 1132, 0000,003D,0180,0800,0000,1259   ;2148      =0      CALL,J/DC4
U 1133, 0001,0028,0180,09A8,0000,12B7   ;214               ALU_NOT.D,RC[5]_ALU
U 12B7, 0000,003C,85F8,0800,0084,72B8   ;2150              SC_K[.C],Q_0
U 12B8, 0D00,003C,0180,0800,0000,12B9   ;2151              D_DAL.SC
U 12B9, 0001,003C,0180,09B8,0000,12BA   ;2152              RC[7]_D
U 12BA, 0810,0038,0180,0928,0000,12BB   ;2153              D_RC[5]
U 12BB, 0000,003C,61F8,0800,0084,72BC   ;2154              SC_K[.F],Q_0
U 12BC, 0D00,003C,0180,0800,0000,12BD   ;2155              D_DAL.SC
U 12BD, 0200,003C,0180,0800,0000,12BE   ;2156              D_D.RIGHT2,SI/ZERO
U 12BE, 0600,003C,0180,0800,0000,12BF   ;2157              D_D.RIGHT,SI/ZERO
U 12BF, 0001,003E,0180,09A8,0000,0001   ;2158              RC[5]_D,RETURN1
```

```
        .PAGE   "TEST CE        CACHE WRITE PULSE LOGIC TEST"
;******************************************************************
;++
; TEST  CE      CACHE WRITE PULSE TEST
;
; TEST DESCRIPTION
;       THIS IS A TEST OF THE CACHE WRITE PULSE LOGIC. TESTED HERE
;       WRITE PULSES GENERATED BY CACHE INVALIDATE (USING THE MCT COMMAND)
;       CACHE WRITE VALID (INCLUDING FORCE REPLACE AND RANDOM REPLACE),
;       AND WRITE HITS. ALSO TESTED ARE THE CACHE HIT/MISS BITS IN
;       THE SBI MAINTENANCE REGISTER AND SIMPLE ONES AND ZEROES
;       DATA PATTERNS IN CACHE LOCATION 'ZERO' (PA<11:03>=0) IN BOTH
;       GROUPS.
;       ASSUMING 4 TEST ADDRESS PATTERNS:       A1=19999000
;                                               A2=06666000
;                                               A3=1B6DB000
;                                               A4=04924000
;       AND 4 TEST DATA PATTERNS:       D1=AAAAAAAA
;                                       D2=55555555
;                                       D3=99999999
;                                       D4=66666666
;       THE TEST SEQUENCE OF EVENTS IS:
;               1       INVALIDATE PA=0 IN BOTH GROUPS
;               2       READ ADDRESS 0 AND CHECK FOR MISS IN BOTH GROUPS
;               3       VALIDATE A1 (WITH DATA D1) IN GROUP 0
;               4       VALIDATE A2 (WITH DATA D2) IN GROUP 1
;               5       READ A1, CHECK FOR HIT IN GROUP 0 AND DATA=D1
;               6       READ A2, CHECK FOR HIT IN GROUP 1 AND DATA=D2
;               7       VALIDATE A3 (WITH DATA D3) IN GROUP 0
;               8       READ A1 AND CHECK FOR MISS IN BOTH GROUPS
;               9       READ A3, CHECK FOR HIT IN GROUP 0 AND DATA=D3
;               A       READ A2, CHECK FOR HIT IN GROUP 1 AND DATA=D2
;               B       VALIDATE A4 (WITH DATA D4) IN GROUP 1
;               C       READ A2 AND CHECK FOR MISS IN BOTH GROUPS
;               D       READ A4, CHECK FOR HIT IN GROUP 1 AND DATA=D4
;               E       READ A3, CHECK FOR HIT IN GROUP 0 AND DATA=D3
;               F       WRITE A3 (WITH DATA D1), A3 ALREADY A HIT IN GROUP 0
;               10      READ A3, CHECK FOR HIT IN GROUP 0 AND DATA=D1
;               11      READ A4, CHECK FOR HIT IN GROUP 1 AND DATA=D4
;               12      WRITE A4 (WITH DATA D2), A4 ALREADY A HIT IN GROUP 1
;               13      READ A4, CHECK FOR HIT IN GROUP 1 AND DATA=D2
;               14      READ A3, CHECK FOR HIT IN GROUP 0 AND DATA=D1
;               15      SET FORCE MISS GROUP 0 BIT
;               16      READ A3 AND CHECK FOR MISS TO BOTH GROUPS
;               17      READ A4 AND CHECK FOR HIT IN GROUP 1 AND DATA=D2
;               18      CLEAR FORCE MISS BITS
;               19      READ A3, CHECK FOR HIT IN GROUP 0 AND DATA=D1
;               1A      SET FORCE MISS GROUP 1 BIT
;               1B      READ A4 AND CHECK FOR MISS TO BOTH GROUPS
;               1C      READ A3 AND CHECK FOR HIT IN GROUP 0 WITH DATA=D1
;               1D      CLEAR FORCE MISS BITS
;               1E      READ A4, CHECK FOR HIT IN GROUP 1 AND DATA=D2
;               1F      MAKE RANDOM FLIP FLOP POINT TO GROUP 0 BY SETTING
;                       AND THEN CLEARING THE FORCE REPLACE GROUP 0
;                       BIT IN THE MAINTENANCE REGISTER
;               20      VALIDATE A1 (WITH DATA D3) THIS WRITE SHOULD
;                       GO INTO GROUP 0.
;               21      VALIDATE A2 (WITH DATA D4) THIS WRITE SHOULD
;                       GO INTO GROUP 1
;               22      READ A1, CHECK FOR HIT IN GROUP 0 AND DATA=D3
;               23      READ A2, CHECK FOR HIT IN GROUP 1 AND DATA=D4
;               24      MAKE RANDOM FLIP FLOP POINT TO GROUP 1 BY SETTING
;                       AND THEN CLEARING THE FORCE REPLACE GROUP 1
;                       BIT IN THE MAINTENANCE REGISTER
;               25      VALIDATE A3 (WITH DATA D1) THIS WRITE SHOULD
;                       GO INTO GROUP 1
;               26      VALIDATE A4 (WITH DATA D2) THIS WRITE SHOULD
;                       GO INTO GROUP 0
;               27      READ A3, CHECK FOR HIT IN GROUP 1 AND DATA=D1
;               28      READ A4, CHECK FOR HIT IN GROUP 0 AND DATA=D2
;       DONE
;
; LOGIC DESCRIPTION
;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
;       REGISTER ON THE SBI CONTROL MODULE.
;
; ERROR DESCRIPTION
;       VA REFERENCED
;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
;               ONLY THE HIT/MISS AND FORCE MISS AND FORCE REPLACE
;               BITS ARE RELEVANT)
;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
;               UTRAP OCCURS
;       GOT CACHE MAINT REGISTER
;       EXPECTED READ DATA
;       GOT READ DATA
;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
;               FLAG            UTRAP TYPE
;               ----            ----------
;               1DE             NO UTRAP OCCURRED
;               DE              CACHE PARITY UTRAP
;               15E             TB PARITY ERROR
;               19E             TB MISS
;               1CE             TB PROTECTION ERROR
;               1D6             TB MODIFY BIT ERROR
;               1DA             X PAGE UTRAP
;               1DC             UNALIGNED DATA UTRAP
;       ERROR CODE: (FOR FAILCHAIN)
;               0=> ERROR OCCURRED IN SEQUENCE #'S 1 OR 2
;               1=> ERROR OCCURRED BEYOND SEQUENCE 3
;
;--
;*********************************************************************
```

```
                                            ;2269   =0
U 1134, 0000,003D,0180,0800,0000,1233       ;2270   CWP:    NEWTST
U 1135, 0F18,0038,5D80,09F8,0000,1136       ;2271           D_0,RC[0F]_K[.7]
U 1136, 0000,003D,4980,3C00,0000,12A7       ;2272   =0      ID[TBER0]_D,CALL,J/CAPAT ; TURN OFF THE TB
                                            ;2273                                    ; AND GO GENERATE SOME
                                            ;2274                                    ; SIMPLE 1'S AND 0'S DATA
                                            ;2275                                    ; AND ADDRESS PATTERNS.
U 1137, 0F03,003C,0180,0AF8,0000,1138       ;2276           R[0F]_0,D_0
U 1138, 0000,003D,0180,0800,0000,1250       ;2277   =0      CALL,J/DC.1DE
U 1139, 0001,003C,0180,0AF0,0000,12C0       ;2278           R[0E]_D
U 12C0, 0003,003C,0180,09C0,0000,113A       ;2279           RC[8]_0                  ; ERROR CODE
U 113A, 0000,003D,0180,0800,0000,1292       ;2280   =0      CALL,J/SOFF              ; DISABLE SBI CYCLES
                                            ;2281   ;//////////////////////////////////////////////////////////////
                                            ;2282   ;+
                                            ;2283   ; [1]   INVALIDATE LOCATION 0 OF BOTH GROUPS
                                            ;2284   ;-
U 113B, 0018,0038,1980,09F0,0200,12C1       ;2285           VA_K[ZERO],RC[0E]_K[ZERO]
U 12C1, 0000,003C,0180,9000,0000,1004       ;2286           FS/MCT,MCT/INVALIDATE    ; WRITE GOOD PARITY INTO
                                            ;2287                                    ; CACHE LOCATION ZERO OF BOTH
                                            ;2288                                    ; GROUPS.
                                            ;2289   ;//////////////////////////////////////////////////////////////
                                            ;2290   ;+
                                            ;2291   ; [2]   READ ADDRESS 0 WHICH SHOULD BE MISS IN BOTH GROUPS
                                            ;2292   ;-
U 1004, 0000,003D,0180,0800,0000,111E       ;2293   =00     CALL,J/RMOM1             ; READ THE LOCTAION BACK TO
                                            ;2294                                    ; INSURE THAT IT IS A MISS
                                            ;2295                                    ; AND THAT IT INDEED HAS
                                            ;2296                                    ; GOOD PARITY.
U 1005, 0000,003D,0180,0800,0000,1247       ;2297           ERROR1                   ; A MICRO TRAP OCCURRED ON THE REFER.
U 1006, 0000,003D,0180,0800,0000,1247       ;2298           ERROR1                   ; THE HIT AND MISS BITS IN THE
                                            ;2299                                    ; SBI MAINTENANCE REGISTER ARE
                                            ;2300                                    ; INCORRECT.
U 1007, 0000,003C,0180,0800,0000,12C2       ;2301           NOP                      ; OK NO UTRAP OR HIT BIT SET.
                                            ;2302   ;//////////////////////////////////////////////////////////////
                                            ;2303   ;+
                                            ;2304   ; [3]   VALIDATE ADDRESS 19999000 AND DATA AAAAAAAA IN GROUP 0
                                            ;2305   ;-
U 12C2, 0018,0038,0580,09C0,0000,113C       ;2306           RC[8]_K[.1]              ; ERROR CODE
U 113C, 0000,003D,0180,0800,0000,1296       ;2307   =0      CALL,J/R0S               ; SET THE FORCE REPLACE GROUP ZERO BIT.
U 113D, 0010,0038,0180,0908,0200,12C3       ;2308           VA_RC[1]                 ; MAKE RC[1] AND DATA RC[0] A HIT IN GROUP 0
U 12C3, 0810,0038,0180,0900,0000,12C4       ;2309           D_RC[0]
U 12C4, 0000,003C,0180,9800,0000,113E       ;2310           FS/MCT,MCT/VALIDATE
                                            ;2311   ;//////////////////////////////////////////////////////////////
                                            ;2312   ;+
                                            ;2313   ; [4]   VALIDATE ADDRESS 06666000 AND DATA 55555555 IN GROUP 1
                                            ;2314   ;-
U 113E, 0000,003D,0180,0800,0000,129A       ;2315   =0      CALL,J/R1S               ; SET THE FORCE REPLACE BIT FOR GROUP 1.
U 113F, 0010,0038,0180,0918,0200,12C5       ;2316           VA_RC[3]                 ; MAKE RC[3] AND DATA RC[2] A HIT IN GROUP 1.
U 12C5, 0810,0038,0180,0910,0000,12C6       ;2317           D_RC[2]
U 12C6, 0000,003C,0180,9800,0000,12C7       ;2318           FS/MCT,MCT/VALIDATE
                                            ;2319   ;//////////////////////////////////////////////////////////////
                                            ;2320   ;+
                                            ;2321   ; [5]   READ ADDRESS 19999000 AND CHECK FOR HIT IN GROUP 0 AND
                                            ;2322   ;       DATA AAAAAAAA
                                            ;2323   ;-
```

```
U 12C7, 0810,0038,0180,0908,0200,12C8   ;2324           VA_RC[1],D_RC[1]
U 12C8, 0001,003C,0180,09F0,0000,12C9   ;2325           RC[0E]_D
U 12C9, 0010,0038,01C0,0900,0000,1008   ;2326           Q_RC[0]
U 1008, 0001,203D,0180,09D8,0000,111A   ;2327   =00     CALL,J/RHOM1,RC[0B]_Q            ; CHECK THE GROUP0 HIT AND DATA.
U 1009, 0000,003D,0180,0800,0000,1247   ;2328           ERROR1                      ; UTRAPPED
U 100A, 0000,003D,0180,0800,0000,1247   ;2329           ERROR1                      ; HIT MISS BITS INCORRECT
U 100B, 001D,2000,0180,0800,0010,12CA   ;2330           ALU_Q-D,CLK.UBCC
U 12CA, 0000,013C,0180,0800,0000,1140   ;2331           Z?
U 1140, 0000,003D,0180,0800,0000,1247   ;2332   =0      ERROR1                      ; DATA INCORRECT.
                                        ;2333   ;///////////////////////////////////////////////////////////////
                                        ;2334   ;+
                                        ;2335   ; [6]   READ ADDRESS 06666000 AND CHECK FOR HIT IN GROUP 1 AND
                                        ;2336   ;       DATA 55555555
                                        ;2337   ;-
U 1141, 0810,0038,0180,0918,0200,12CB   ;2338           VA_RC[3],D_RC[3]
U 12CB, 0001,003C,0180,09F0,0000,12CC   ;2339           RC[0E]_D
U 12CC, 0010,0038,01C0,0910,0000,100C   ;2340           Q_RC[2]
U 100C, 0001,203D,0180,09D8,0000,111C   ;2341   =00     CALL,J/RMOH1,RC[0B]_G       ; CHECK THE GROUP1 HIT AND DATA.
U 100D, 0000,003D,0180,0800,0000,1247   ;2342           ERROR1                      ; UTRAPPED
U 100E, 0000,003D,0180,0800,0000,1247   ;2343           ERROR1                      ; HIT MISS BITS INCORRECT.
U 100F, 001D,2000,0180,0800,0010,12CD   ;2344           ALU_Q-D,CLK.UBCC
U 12CD, 0000,013C,0180,0800,0000,1142   ;2345           Z?
U 1142, 0000,003D,0180,0800,0000,1247   ;2346   =0      ERROR1                      ; DATA INCORRECT.
U 1143, 0000,003C,0180,0800,0000,1144   ;2347           NOP
                                        ;2348   ;///////////////////////////////////////////////////////////////
                                        ;2349   ;+
                                        ;2350   ; [7]   VALIDATE ADDRESS 1B6DB000 WITH DATA 99999999 IN GROUP 0
                                        ;2351   ;       OVERWRITE THE GROUP 0 HIT AND CHECK FOR WRITE ONLY TO GROUP 0
                                        ;2352   ;-
U 1144, 0000,003D,0180,0800,0000,1296   ;2353   =0      CALL,J/ROS                  ; FORCE REPLACEMENT OF GROUP 0
U 1145, 0010,0038,0180,0928,0200,12CE   ;2354           VA_RC[5]
U 12CE, 0810,0038,0180,0920,0000,12CF   ;2355           D_RC[4]
U 12CF, 0000,003C,0180,9800,0000,12D0   ;2356           FS/MCT,MCT/VALIDATE
                                        ;2357   ;///////////////////////////////////////////////////////////////
                                        ;2358   ;+
                                        ;2359   ; [8]   READ ADDRESS 19999000 AND CHECK FOR MISS TO BOTH GROUPS
                                        ;2360   ;-
U 12D0, 0810,0038,0180,0908,0200,12D1   ;2361           VA_RC[1],D_RC[1]
U 12D1, 0001,003C,0180,09F0,0000,1010   ;2362           RC[0E]_D
U 1010, 0000,003D,0180,0800,0000,111E   ;2363   =00     CALL,J7RMOM1                ; CHECK FOR MISS AT OLD ADDRESS
U 1011, 0000,003D,0180,0800,0000,1247   ;2364           ERROR1                      ; UTRAPPED
U 1012, 0000,003D,0180,0800,0000,1247   ;2365           ERROR1                      ; HIT MISS BITS INCORRECT
                                        ;2366   ;///////////////////////////////////////////////////////////////
                                        ;2367   ;+
                                        ;2368   ; [9]   READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0 AND
                                        ;2369   ;       DATA 999999999
                                        ;2370   ;-
U 1013, 0810,0038,0180,0928,0200,12D2   ;2371           VA_RC[5],D_RC[5]
U 12D2, 0001,003C,0180,09F0,0000,12D3   ;2372           RC[0E]_D
U 12D3, 0010,0038,01C0,0920,0000,1014   ;2373           Q_RC[4]
U 1014, 0001,203D,0180,09D8,0000,111A   ;2374   =00     CALL,J/RHOM1,RC[0B]_Q            ; CHECK FOR HIT AT NEW ADDRESS IN GROUP 0
U 1015, 0000,003D,0180,0800,0000,1247   ;2375           ERROR1                      ; UTRAPPED
U 1016, 0000,003D,0180,0800,0000,1247   ;2376           ERROR1                      ; HIT MISS BITS INCORRECT
U 1017, 001D,2000,0180,0800,0010,12D4   ;2377           ALU_Q-D,CLK.UBCC
U 12D4, 0000,013C,0180,0800,0000,1146   ;2378           Z?
```

```
U 1146, 0000,003D,0180,0800,0000,1247   ;2379   =0      ERROR1                  ; DATA INCORRECT
                                        ;2380   ;///////////////////////////////////////////////////////////////
                                        ;2381   ;+
                                        ;2382   ; [A]   READ ADDRESS 06666000 AND CHECK FOR HIT IN GROUP 1 AND
                                        ;2383   ;       DATA 55555555
                                        ;2384   ;-
U 1147, 0810,0038,0180,0918,0200,12D5   ;2385           VA_RC[3],D_RC[3]
U 12D5, 0001,003C,0180,09F0,0000,12D6   ;2386           RC[0E]_D
U 12D6, 0010,0038,01C0,0910,0000,1018   ;2387           Q_RC[2]
U 1018, 0001,203D,0180,09D8,0000,111C   ;2388   =00     CALL,J/RMOH1,RC[0B]_Q           ; CHECK FOR GROUP ONE INTEGRITY
                                        ;2389                                   ; AFTER WRITE TO GROUP 0.
U 1019, 0000,003D,0180,0800,0000,1247   ;2390           ERROR1                  ; UTRAPPED
U 101A, 0000,003D,0180,0800,0000,1247   ;2391           ERROR1                  ; HIT MISS BITS INCORRECT
U 101B, 001D,2000,0180,0800,0010,12D7   ;2392           ALU_Q-D,CLK.UBCC
U 12D7, 0000,013C,0180,0800,0000,1148   ;2393           Z?
U 1148, 0000,003D,0180,0800,0000,1247   ;2394   =0      ERROR1                  ; DATA IN GROUP 1 INCORRECT.
U 1149, 0000,003C,0180,0800,0000,114A   ;2395           NOP
                                        ;2396   ;///////////////////////////////////////////////////////////////
                                        ;2397   ;+
                                        ;2398   ; [B]   VALIDATE ADDRESS 04924000 WITH DATA 66666666 IN GROUP 1
                                        ;2399   ;       OVERWRITE GROUP 1 HIT AND CHECK FOR WRITE ONLY TO GROUP 1
                                        ;2400   ;-
U 114A, 0000,003D,0180,0800,0000,129A   ;2401   =0      CALL,J/R1S
U 114B, 0010,0038,0180,0938,0200,12D8   ;2402           VA_RC[7]
U 12D8, 0810,0038,0180,0930,0000,12D9   ;2403           D_RC[6]
U 12D9, 0000,003C,0180,9800,0000,12DA   ;2404           FS/MCT,MCT/VALIDATE
                                        ;2405   ;///////////////////////////////////////////////////////////////
                                        ;2406   ;+
                                        ;2407   ; [C]   READ ADDRESS 06666000 AND CHECK FOR MISS IN BOTH GROUPS
                                        ;2408   ;-
U 12DA, 0810,0038,0180,0918,0200,12DB   ;2409           VA_RC[3],D_RC[3]
U 12DB, 0001,003C,0180,09F0,0000,101C   ;2410           RC[0E]_D
U 101C, 0000,003D,0180,0800,0000,111E   ;2411   =00     CALL,J7RMOM1            ; CHECK FOR MISS AT OLD ADDRESS
U 101D, 0000,003D,0180,0800,0000,1247   ;2412           ERROR1                  ; UTRAPPED
U 101E, 0000,003D,0180,0800,0000,1247   ;2413           ERROR1                  ; HIT MISS BITS INCORRECT
                                        ;2414   ;///////////////////////////////////////////////////////////////
                                        ;2415   ;+
                                        ;2416   ; [D]   READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 1 AND
                                        ;2417   ;       DATA 66666666
                                        ;2418   ;-
U 101F, 0810,0038,0180,0938,0200,12DC   ;2419           VA_RC[7],D_RC[7]
U 12DC, 0001,003C,0180,09F0,0000,12DD   ;2420           RC[0E]_D
U 12DD, 0010,0038,01C0,0930,0000,1020   ;2421           Q_RC[6]
U 1020, 0001,203D,0180,09D8,0000,111C   ;2422   =00     CALL,J/RMOH1,RC[0B]_Q   ; CHECK FOR HIT IN GROUP 1 AT NEW ADDR.
U 1021, 0000,003D,0180,0800,0000,1247   ;2423           ERROR1                  ; UTRAPPED
U 1022, 0000,003D,0180,0800,0000,1247   ;2424           ERROR1                  ; HIT MISS BITS INCORRECT.
U 1023, 001D,2000,0180,0800,0010,12DE   ;2425           ALU_Q-D,CLK.UBCC
U 12DE, 0000,013C,0180,0800,0000,114C   ;2426           Z?
U 114C, 0000,003D,0180,0800,0000,1247   ;2427   =0      ERROR1                  ; GROUP 1 DATA INCORRECT.
                                        ;2428   ;///////////////////////////////////////////////////////////////
                                        ;2429   ;+
                                        ;2430   ; [E]   READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0 AND
                                        ;2431   ;       DATA 999999999
                                        ;2432   ;-
U 114D, 0810,0038,0180,0928,0200,12DF   ;2433           VA_RC[5],D_RC[5]
```

```
U 12DF, 0001,003C,0180,09F0,0000,12E0   ;2434           RC[0E]_D
U 12E0, 0010,0038,01C0,0920,0000,1024   ;2435           Q_RC[4]
U 1024, 0001,203D,0180,09D8,0000,111A   ;2436   =00     CALL,J/RHOM1,RC[0B]_Q   ; CHECK GROUP 0 DATA AND HIT AFTER
                                        ;2437                                   ; WRITING GROUP 1
U 1025, 0000,003D,0180,0800,0000,1247   ;2438           ERROR1                  ; UTRAPPED
U 1026, 0000,003D,0180,0800,0000,1247   ;2439           ERROR1                  ; HIT MISS BITS INCORRECT.
U 1027, 001D,2000,0180,0800,0010,12E1   ;2440           ALU_Q-D,CLK.UBCC
U 12E1, 0000,013C,0180,0800,0000,114E   ;2441           Z?
U 114E, 0000,003D,0180,0800,0000,1247   ;2442   =0      ERROR1                  ; DATA INCORRECT
U 114F, 0000,003C,0180,0800,0000,12E2   ;2443           NOP
                                        ;2444   ;//////////////////////////////////////////////////////////////////
                                        ;2445   ;+
                                        ;2446   ; [F]   WRITE ADDRESS 1B6DB000 WITH DATA AAAAAAAA, THIS WRITE
                                        ;2447   ;       SHOULD GO INTO GROUP 0 BECAUSE ADDRESS 1B6DB000 IS A HIT THERE.
                                        ;2448   ;       TEST THE WRITE PULSE GENERATION ON WRITE HIT CYCLES TO GROUP 0.
                                        ;2449   ;-
U 12E2, 0810,0038,0180,0928,0200,12E3   ;2450           VA_RC[5],D_RC[5]
U 12E3, 0001,003C,0180,09F0,0000,12E4   ;2451           RC[0E]_D
U 12E4, 0810,0038,0180,0900,0000,1028   ;2452           D_RC[0]
U 1028, 0000,003D,0180,0800,0000,128B   ;2453   =00     CALL,J/WRITE            ; DO A WRITE WHICH IS ALREADY A HIT
                                        ;2454                                   ; IN GROUP 0.
U 1029, 0000,003D,0180,0800,0000,1247   ;2455           ERROR1                  ; UTRAPPED
U 102A, 0000,003C,0180,0800,0000,12E5   ;2456           NOP
                                        ;2457   =
                                        ;2458   ;//////////////////////////////////////////////////////////////////
                                        ;2459   ;+
                                        ;2460   ; [10]  READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0 WITH
                                        ;2461   ;       DATA AAAAAAAA
                                        ;2462   ;-
U 12E5, 0010,0038,01C0,0900,0000,102C   ;2463           Q_RC[0]
U 102C, 0001,203D,0180,09D8,0000,111A   ;2464   =00     CALL,J/RHOM1,RC[0B]_Q   ; CHECK THE NEW DATA IN GROUP 0
U 102D, 0000,003D,0180,0800,0000,1247   ;2465           ERROR1                  ; UTRAPPED
U 102E, 0000,003D,0180,0800,0000,1247   ;2466           ERROR1                  ; HIT MISS BITS INCORRECT
U 102F, 001D,2000,0180,0800,0010,12E6   ;2467           ALU_Q-D,CLK.UBCC
U 12E6, 0000,013C,0180,0800,0000,1150   ;2468           Z?
U 1150, 0000,003D,0180,0800,0000,1247   ;2469   =0      ERROR1                  ; DATA INCORRECT.
                                        ;2470   ;//////////////////////////////////////////////////////////////////
                                        ;2471   ;+
                                        ;2472   ; [11]  READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 1
                                        ;2473   ;       WITH DATA 66666666
                                        ;2474   ;-
U 1151, 0810,0038,0180,0938,0200,12E7   ;2475           VA_RC[7],D_RC[7]
U 12E7, 0001,003C,0180,09F0,0000,12E8   ;2476           RC[0E]_D
U 12E8, 0010,0038,01C0,0930,0000,1030   ;2477           Q_RC[6]
U 1030, 0001,203D,0180,09D8,0000,111C   ;2478   =00     CALL,J/RMOH1,RC[0B]_Q   ; CHECK THE GROUP1 HIT AND DATA
U 1031, 0000,003D,0180,0800,0000,1247   ;2479           ERROR1                  ; UTRAPPED
U 1032, 0000,003D,0180,0800,0000,1247   ;2480           ERROR1                  ; HIT MISS BITS INCORRECT
U 1033, 001D,2000,0180,0800,0010,12E9   ;2481           ALU_Q-D,CLK.UBCC
U 12E9, 0000,013C,0180,0800,0000,1152   ;2482           Z?
U 1152, 0000,003D,0180,0800,0000,1247   ;2483   =0      ERROR1                  ; DATA INCORRECT
U 1153, 0000,003C,0180,0800,0000,12EA   ;2484           NOP
                                        ;2485   ;//////////////////////////////////////////////////////////////////
                                        ;2486   ;+
                                        ;2487   ; [12]  WRITE ADDRESS 04924000 WITH DATA 55555555, THIS WRITE
                                        ;2488   ;       SHOULD GO INTO GROUP 1 BECAUSE ADDESS 04924000 IS A HIT THERE.
```

```
                                            ;2489   :       TEST THE WRITE PULSE GENERATION ON WRITE HITS IN GROUP 1
                                            ;2490   :-
U 12EA, 0810,0038,0180,0938,0200,12EB       ;2491           VA_RC[7],D_RC[7]
U 12EB, 0001,003C,0180,09F0,0000,12EC       ;2492           RC[0E]_D
U 12EC, 0810,0038,0180,0910,0000,1034       ;2493           D_RC[2]
U 1034, 0000,003D,0180,0800,0000,128B       ;2494   =00     CALL,J/WRITE
U 1035, 0000,003D,0180,0800,0000,1247       ;2495           ERROR1                  ; UTRAPPED
U 1036, 0000,003C,0180,0800,0000,12ED       ;2496           NOP
                                            ;2497   =
                                            ;2498   ;//////////////////////////////////////////////////////////////
                                            ;2499   :+
                                            ;2500   : [13]  READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 1 WITH
                                            ;2501   :       DATA 55555555
                                            ;2502   :-
U 12ED, 0010,0038,01C0,0910,0000,1038       ;2503           Q_RC[2]
U 1038, 0001,203D,0180,09D8,0000,111C       ;2504   =00     CALL,J/RMOH1,RC[0B]_Q   ; CHECK HIT AND NEW DATA IN GROUP 1
U 1039, 0000,003D,0180,0800,0000,1247       ;2505           ERROR1                  ; UTRAPPED
U 103A, 0000,003D,0180,0800,0000,1247       ;2506           ERROR1                  ; HIT MISS BITS INCORRECT
U 103B, 001D,2000,0180,0800,0010,12EE       ;2507           ALU_Q-D,CLK.UBCC
U 12EE, 0000,013C,0180,0800,0000,1156       ;2508           Z?
U 1156, 0000,003D,0180,0800,0000,1247       ;2509   =0      ERROR1                  ; DATA IN GROUP 1 INCORRECT
                                            ;2510   ;//////////////////////////////////////////////////////////////
                                            ;2511   :+
                                            ;2512   : [14]  READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0 WITH
                                            ;2513   :       DATA AAAAAAAA
                                            ;2514   :-
U 1157, 0810,0038,0180,0928,0200,12EF       ;2515           VA_RC[5],D_RC[5]
U 12EF, 0001,003C,0180,09F0,0000,12F0       ;2516           RC[0E]_D
U 12F0, 0010,0038,01C0,0900,0000,103C       ;2517           Q_RC[0]
U 103C, 0001,203D,0180,09D8,0000,111A       ;2518   =00     CALL,J/RHOM1,RC[0B]_Q   ; CHECK HIT AND DATA IN GROUP 0
U 103D, 0000,003D,0180,0800,0000,1247       ;2519           ERROR1                  ; UTRAPPED
U 103E, 0000,003D,0180,0800,0000,1247       ;2520           ERROR1                  ; HIT MISS BITS INCORRECT
U 103F, 001D,2000,0180,0800,0010,12F1       ;2521           ALU_Q-D,CLK.UBCC
U 12F1, 0000,013C,0180,0800,0000,1158       ;2522           Z?
U 1158, 0000,003D,0180,0800,0000,1247       ;2523   =0      ERROR1                  ; DATA INCORRECT
U 1159, 0000,003C,0180,0800,0000,115A       ;2524           NOP
                                            ;2525   ;//////////////////////////////////////////////////////////////
                                            ;2526   :+
                                            ;2527   : [15]  CHECK THE FORCE MISS MAINTENANCE BITS IN THE SBI MAINTENANCE
                                            ;2528   :       REGISTER FOR GROUP 0.
                                            ;2529   :       SET THE FORCE MISS IN GROUP 0 BIT.
                                            ;2530   :-
U 115A, 0000,003D,0180,0800,0000,129C       ;2531   =0      CALL,J/MOS              ; SET FORCE MISS BIT FOR GROUP 0
                                            ;2532   ;//////////////////////////////////////////////////////////////
                                            ;2533   :+
                                            ;2534   : [16]  READ ADDRESS 1B6DB000 AND CHECK FOR MISS IN BOTH GROUPS
                                            ;2535   :-
U 115B, 0810,0038,0180,0928,0200,12F2       ;2536           VA_RC[5],D_RC[5]
U 12F2, 0001,003C,0180,09F0,0000,1040       ;2537           RC[0E]_D
U 1040, 0000,003D,0180,0800,0000,111E       ;2538   =00     CALL,J7RMOM1            ; SEE IF ADDRESS IS A MISS
U 1041, 0000,003D,0180,0800,0000,1247       ;2539           ERROR1                  ; UTRAPPED
U 1042, 0000,003D,0180,0800,0000,1247       ;2540           ERROR1                  ; HIT MISS BITS INCORRECT.
                                            ;2541   ;//////////////////////////////////////////////////////////////
                                            ;2542   :+
                                            ;2543   : [17]  READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 1 WITH
```

```
                                         ;2544   ;       DATA 55555555
                                         ;2545   ;-
U 1043, 0810,0038,0180,0938,0200,12F3    ;2546           VA_RC[7],D_RC[7]
U 12F3, 0001,003C,0180,09F0,0000,12F4    ;2547           RC[0E]_D
U 12F4, 0010,0038,01C0,0910,0000,1044    ;2548           Q_RC[2]
U 1044, 0001,203D,0180,09D8,0000,111C    ;2549   =00     CALL,J/RMOH1,RC[0B]_Q    ; MAKE SURE THE GROUP 0 FORCE MISS
                                         ;2550                                    ; BIT AFFECTS GROUP 1
U 1045, 0000,003D,0180,0800,0000,1247    ;2551           ERROR1                   ; UTRAPPED
U 1046, 0000,003D,0180,0800,0000,1247    ;2552           ERROR1                   ; HIT MISS BITS INCORRECT
U 1047, 001D,2000,0180,0800,0010,12F5    ;2553           ALU_Q-D,CLK.UBCC
U 12F5, 0000,013C,0180,0800,0000,115C    ;2554           Z?
U 115C, 0000,003D,0180,0800,0000,1247    ;2555   =0      ERROR1                   ; GROUP 1 DATA INCORRECT.
U 115D, 0000,003C,0180,0800,0000,115E    ;2556           NOP
                                         ;2557   ;///////////////////////////////////////////////////////////////
                                         ;2558   ;+
                                         ;2559   ; [18]  CLEAR THE GROUP 0 FORCE MISS BIT
                                         ;2560   ;-
U 115E, 0000,003D,0180,0800,0000,1292    ;2561   =0      CALL,J/SOFF              ; CLEAR THE FORCE MISS GROUP 0 BIT
                                         ;2562   ;///////////////////////////////////////////////////////////////
                                         ;2563   ;+
                                         ;2564   ; [19]  READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0 WITH
                                         ;2565   ;       DATA AAAAAAAA
                                         ;2566   ;-
U 115F, 0810,0038,0180,0928,0200,12F6    ;2567           VA_RC[5],D_RC[5]
U 12F6, 0001,003C,0180,09F0,0000,12F7    ;2568           RC[0E]_D
U 12F7, 0010,0038,01C0,0900,0000,1048    ;2569           Q_RC[0]
U 1048, 0001,203D,0180,09D8,0000,111A    ;2570   =00     CALL,J/RHOM1,RC[0B]_Q    ; TEST THE GROUP 0 HIT WITHOUT
                                         ;2571                                    ; FORCING MISSES
U 1049, 0000,003D,0180,0800,0000,1247    ;2572           ERROR1                   ; UTRAPPED
U 104A, 0000,003D,0180,0800,0000,1247    ;2573           ERROR1                   ; HIT/MISS BITS INCORRECT
U 104B, 001D,2000,0180,0800,0010,12F8    ;2574           ALU_Q-D,CLK.UBCC
U 12F8, 0000,013C,0180,0800,0000,1160    ;2575           Z?
U 1160, 0000,003D,0180,0800,0000,1247    ;2576   =0      ERROR1                   ; GROUP 0 DATA INCORRECT.
U 1161, 0000,003C,0180,0800,0000,1162    ;2577           NOP
                                         ;2578   ;///////////////////////////////////////////////////////////////
                                         ;2579   ;+
                                         ;2580   ; [1A]  CHECK THE FORCE MISS BIT FOR GROUP 1.
                                         ;2581   ;-
U 1162, 0000,003D,0180,0800,0000,129E    ;2582   =0      CALL,J/M1S               ; SET THE FORCE MISS BIT FOR GROUP 1
                                         ;2583   ;///////////////////////////////////////////////////////////////
                                         ;2584   ;+
                                         ;2585   ; [1B]  READ ADDRESS 04924000 AND CHECK FOR MISS IN BOTH GROUPS
                                         ;2586   ;-
U 1163, 0810,0038,0180,0938,0200,12F9    ;2587           VA_RC[7],D_RC[7]
U 12F9, 0001,003C,0180,09F0,0000,1050    ;2588           RC[0E]_D
U 1050, 0000,003D,0180,0800,0000,111E    ;2589   =00     CALL,J/RMOM1
U 1051, 0000,003D,0180,0800,0000,1247    ;2590           ERROR1                   ; UTRAPPED
U 1052, 0000,003D,0180,0800,0000,1247    ;2591           ERROR1                   ; HIT/MISS BITS INCORRECT
                                         ;2592   ;///////////////////////////////////////////////////////////////
                                         ;2593   ;+
                                         ;2594   ; [1C]  READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 0
                                         ;2595   ;       WITH DATA AAAAAAAA
                                         ;2596   ;-
U 1053, 0810,0038,0180,0928,0200,12FA    ;2597           VA_RC[5],D_RC[5]
U 12FA, 0001,003C,0180,09F0,0000,12FB    ;2598           RC[0E]_D
```

```
U 12FB, 0010,0038,01C0,0900,0000,1054   ;2599           Q_RC[0]
U 1054, 0001,203D,0180,09D8,0000,111A   ;2600   =00     CALL,J/RHOM1,RC[0B]_Q    ; MAKE SURE GROUP 0 IS NOT AFFECTED.
U 1055, 0000,003D,0180,0800,0000,1247   ;2601           ERROR1                   ; UTRAPPED
U 1056, 0000,003D,0180,0800,0000,1247   ;2602           ERROR1                   ; HIT MISS BITS INCORRECT
U 1057, 001D,2000,0180,0800,0010,12FC   ;2603           ALU_Q-D,CLK.UBCC
U 12FC, 0000,013C,0180,0800,0000,1164   ;2604           Z?
U 1164, 0000,003D,0180,0800,0000,1247   ;2605   =0      ERROR1                   ; DATA INCORRECT
U 1165, 0000,003C,0180,0800,0000,1166   ;2606           NOP
                                        ;2607   ;//////////////////////////////////////////////////////////////
                                        ;2608   ;+
                                        ;2609   ; [1D]  CLEAR THE FORCE MISS BIT IN GROUP 1
                                        ;2610   ;-
U 1166, 0000,003D,0180,0800,0000,1292   ;2611   =0      CALL,J/SOFF              ; TURN OF THE FORCE MISS BIT.
                                        ;2612   ;//////////////////////////////////////////////////////////////
                                        ;2613   ;+
                                        ;2614   ; [1E]  READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 1
                                        ;2615   ;       WITH DATA 55555555
                                        ;2616   ;-
U 1167, 0810,0038,0180,0938,0200,12FD   ;2617           VA_RC[7],D_RC[7]
U 12FD, 0001,003C,0180,09F0,0000,12FE   ;2618           RC[0E]_D
U 12FE, 0010,0038,01C0,0910,0000,1060   ;2619           Q_RC[2]
U 1060, 0001,203D,0180,09D8,0000,111C   ;2620   =00     CALL,J/RMOH1,RC[0B]_Q    ; CHECK FOR THE GROUP 1 HIT WITHOUT
                                        ;2621                                    ; FORCING MISSES.
U 1061, 0000,003D,0180,0800,0000,1247   ;2622           ERROR1                   ; UTRAPPED
U 1062, 0000,003D,0180,0800,0000,1247   ;2623           ERROR1                   ; HIT MISS BITS INCORRECT.
U 1063, 001D,2000,0180,0800,0010,12FF   ;2624           ALU_Q-D,CLK.UBCC
U 12FF, 0000,013C,0180,0800,0000,1168   ;2625           Z?
U 1168, 0000,003D,0180,0800,0000,1247   ;2626   =0      ERROR1                   ; DATA INCORRECT
U 1169, 0000,003C,0180,0800,0000,116A   ;2627           NOP
                                        ;2628   ;//////////////////////////////////////////////////////////////
                                        ;2629   ;+
                                        ;2630   ; [1F]  CHECK THE RANDOM REPLACEMENT OF DATA WRITING FIRST INTO
                                        ;2631   ;       GROUP 0 THEN INTO GROUP 1.
                                        ;2632   ;       MAKE THE RANDOM FLIP FLIP POINT TO GROUP 0
                                        ;2633   ;       BY FIRST SETTING AND THEN CLEARING THE REPLACE
                                        ;2634   ;       GROUP 0 BIT IN THE MAINT REGISTER.
                                        ;2635   ;-
U 116A, 0000,003D,0180,0800,0000,1296   ;2636   =0      CALL,J/ROS
U 116B, 0000,003C,8580,0800,0084,7300   ;2637           SC_K[.C]
U 1300, 0803,001C,0180,0800,0000,1301   ;2638           ALU_NOT.MASK,D_ALU
U 1301, 0000,003C,7580,3C00,0000,1302   ;2639           ID[MAINT]_D
                                        ;2640   ;//////////////////////////////////////////////////////////////
                                        ;2641   ;+
                                        ;2642   ; [20]  VALIDATE ADDRESS 19999000 WITH DATA 99999999
                                        ;2643   ;       THIS SHOULD BE MADE A HIT IN GROUP 0.
                                        ;2644   ;-
U 1302, 0010,0038,0180,0908,0200,1303   ;2645           VA_RC[1]
U 1303, 0810,0038,0180,0920,0000,1304   ;2646           D_RC[4]
U 1304, 0000,003C,0180,9800,0000,1305   ;2647           FS/MCT,MCT/VALIDATE      ; THIS WRITE SHOULD GO INTO
                                        ;2648                                    ; GROUP 0.
                                        ;2649   ;//////////////////////////////////////////////////////////////
                                        ;2650   ;+
                                        ;2651   ; [21]  VALIDATE ADDRESS 06666000 WITH DATA 66666666.
                                        ;2652   ;       THIS SHOULD BE MADE A HIT IN GROUP 1.
                                        ;2653   ;-
```

```
U 1305, 0010,0038,0180,0918,0200,1306   ;2654           VA_RC[3]
U 1306, 0810,0038,0180,0930,0000,1307   ;2655           D_RC[6]
U 1307, 0000,003C,0180,9800,0000,1308   ;2656           FS/MCT,MCT/VALIDATE     ; THIS WRITE SHOULD GO INTO
                                        ;2657                                   ; GROUP 1.
                                        ;2658   ;//////////////////////////////////////////////////////////////////
                                        ;2659   ;+
                                        ;2660   ; [22]  READ ADDRESS 19999000 AND CHECK FOR HIT IN GROUP 0
                                        ;2661   ;       WITH DATA 99999999
                                        ;2662   ;-
U 1308, 0810,0038,0180,0908,0200,1309   ;2663           VA_RC[1],D_RC[1]
U 1309, 0001,003C,0180,09F0,0000,130A   ;2664           RC[0E]_D
U 130A, 0010,0038,01C0,0920,0000,1064   ;2665           Q_RC[4]
U 1064, 0001,203D,0180,09D8,0000,111A   ;2666   =00     CALL,J/RHOM1,RC[0B]_Q   ; CHECK THE HIT AT THE FIRST ADDRESS WRITTEN
U 1065, 0000,003D,0180,0800,0000,1247   ;2667           ERROR1                  ; UTRAPPED
U 1066, 0000,003D,0180,0800,0000,1247   ;2668           ERROR1                  ; HIT MISS BITS INCORRECT.
U 1067, 001D,2000,0180,0800,0010,130B   ;2669           ALU_Q-D,CLK.UBCC
U 130B, 0000,013C,0180,0800,0000,116C   ;2670           Z?
U 116C, 0000,003D,0130,0800,0000,1247   ;2671   =0      ERROR1                  ; GROUP 0 DATA INCORRECT
                                        ;2672   ;//////////////////////////////////////////////////////////////////
                                        ;2673   ;+
                                        ;2674   ; [23]  READ ADDRESS 06666000 AND CHECK FOR HIT IN GROUP 1
                                        ;2675   ;       WITH DATA 66666666
                                        ;2676   ;-
U 116D, 0810,0038,0180,0918,0200,130C   ;2677           VA_RC[3],D_RC[3]
U 130C, 0001,003C,0180,09F0,0000,130D   ;2678           RC[0E]_D
U 130D, 0010,0038,01C0,0930,0000,1068   ;2679           Q_RC[6]
U 1068, 0001,203D,0180,09D8,0000,111C   ;2680   =00     CALL,J/RMOH1,RC[0B]_Q   ; CHECK FOR A HIT IN GROUP 1 AT THE
                                        ;2681                                   ; SECOND ADDRESS WRITTEN.
U 1069, 0000,003D,0180,0800,0000,1247   ;2682           ERROR1                  ; UTRAPPED
U 106A, 0000,003D,0180,0800,0000,1247   ;2683           ERROR1                  ; HIT MISS BITS INCORRECT.
U 106B, 001D,2000,0180,0800,0010,130E   ;2684           ALU_Q-D,CLK.UBCC
U 130E, 0000,013C,0180,0800,0000,116E   ;2685           Z?
U 116E, 0000,003D,0180,0800,0000,1247   ;2686   =0      ERROR1                  ; GROUP 1 DATA INCORRECT
U 116F, 0000,003C,0180,0800,0000,1170   ;2687           NOP
                                        ;2688   ;//////////////////////////////////////////////////////////////////
                                        ;2689   ;+
                                        ;2690   ; [24]  CHECK RANDOM REPLACEMENT OF DATA WRITING FIRST GROUP 1 THEN GROUP 0.
                                        ;2691   ;       SET THE RANDOM FF TO POINT TO GROUP 1 BY FIRST SETTING
                                        ;2692   ;       AND THEN CLEARING THE FORCE REPLACEMENT OF GROUP 1
                                        ;2693   ;       BIT IN THE MAINT REGISTER.
                                        ;2694   ;-
U 1170, 0000,003D,0180,0800,0000,129A   ;2695   =0      CALL,J/R1S
U 1171, 0000,003C,8580,0800,0084,730F   ;2696           SC_K[.C]
U 130F, 0803,001C,0180,0800,0000,1310   ;2697           ALU_NOT.MASK,D_ALU
U 1310, 0000,003C,7580,3C00,0000,1311   ;2698           ID[MAINT]_D
                                        ;2699   ;//////////////////////////////////////////////////////////////////
                                        ;2700   ;+
                                        ;2701   ; [25]  VALIDATE ADDRESS 1B6DB000 WITH DATA AAAAAAAA
                                        ;2702   ;       THIS SHOULD BE MADE A HIT IN GROUP 1.
                                        ;2703   ;-
U 1311, 0010,0038,0180,0928,0200,1312   ;2704           VA_RC[5]
U 1312, 0810,0038,0180,0900,0000,1313   ;2705           D_RC[0]
U 1313, 0000,003C,0180,9800,0000,1314   ;2706           FS/MCT,MCT/VALIDATE     ; SHOULD BE WRITTEN INTO GROUP 1
                                        ;2707   ;//////////////////////////////////////////////////////////////////
                                        ;2708   ;+
                                          ;2709   ; [26]  VALIDATE ADDRESS 04924000 WITH DATA 55555555
                                          ;2710   ;       THIS SHOULD BE MADE A HIT IN GROUP 0
                                          ;2711   ;-
U 1314, 0010,0038,0180,0938,0200,1315    ;2712           VA_RC[7]
U 1315, 0810,0038,0180,0910,0000,1316    ;2713           D_RC[2]
U 1316, 0000,003C,0180,9800,0000,1317    ;2714           FS/MCT,MCT/VALIDATE
                                          ;2715   ;//////////////////////////////////////////////////////////////////////
                                          ;2716   ;+
                                          ;2717   ; [27]  READ ADDRESS 1B6DB000 AND CHECK FOR HIT IN GROUP 1
                                          ;2718   ;       WITH DATA AAAAAAAA.
                                          ;2719   ;-
U 1317, 0810,0038,0180,0928,0200,1318    ;2720           VA_RC[5],D_RC[5]
U 1318, 0001,003C,0180,09F0,0000,1319    ;2721           RC[OE]_D
U 1319, 0010,0038,01C0,0900,0000,106C    ;2722           Q_RC[0]
U 106C, 0001,203D,0180,09D8,0000,111C    ;2723   =00     CALL,J/RMOH1,RC[OB]_Q      ; CHECK THE HIT IN GROUP ONE AT THE
                                          ;2724                                      ; FIRST ADDRESS WRITTEN.
U 106D, 0000,003D,0180,0800,0000,1247    ;2725           ERROR1                     ; UTRAPPED
U 106E, 0000,003D,0180,0800,0000,1247    ;2726           ERROR1                     ; HIT MISS BITS INCORRECT.
U 106F, 001D,2000,0180,0800,0010,131A    ;2727           ALU_Q-D,CLK.UBCC
U 131A, 0000,013C,0180,0800,0000,1172    ;2728           Z?
U 1172, 0000,003D,0180,0800,0000,1247    ;2729   =0      ERROR1                     ; GROUP 1 DATA INCORRECT.
                                          ;2730   ;//////////////////////////////////////////////////////////////////////
                                          ;2731   ;+
                                          ;2732   ; [28]  READ ADDRESS 04924000 AND CHECK FOR HIT IN GROUP 0
                                          ;2733   ;       WITH DATA 55555555.
                                          ;2734   ;-
U 1173, 0810,0038,0180,0938,0200,131B    ;2735           VA_RC[7],D_RC[7]
U 131B, 0001,003C,0180,09F0,0000,131C    ;2736           RC[OE]_D
U 131C, 0010,0038,01C0,0910,0000,1070    ;2737           Q_RC[2]
U 1070, 0001,203D,0180,09D8,0000,111A    ;2738   =00     CALL,J/RHOM1,RC[OB]_Q
U 1071, 0000,003D,0180,0800,0000,1247    ;2739           ERROR1                     ; UTRAPPED
U 1072, 0000,003D,0180,0800,0000,1247    ;2740           ERROR1                     ; HIT MISS BIT INCORRECT
U 1073, 001D,2000,0180,0800,0010,131D    ;2741           ALU_Q-D,CLK.UBCC
U 131D, 0000,013C,0180,0800,0000,1174    ;2742           Z?
U 1174, 0000,003D,0180,0800,0000,1247    ;2743   =0      ERROR1                     ; GROUP 0 DATA INCORRECT.
U 1175, 0000,003C,0180,0800,0000,1176    ;2744           NOP
```

```
                                                .PAGE   "TEST CF        ADDRESS BIT 2 IN GROUP 0 TEST"
                                        ;*******************************************************************
                                        ;++
                                        ; TEST  CF      ADDRESS BIT 2 IN GROUP 0 TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF ADDRESS BIT 2 IN GROUP 0.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                        ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       VA REFERENCED
                                        ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                        ;               ONLY HIT/MISS AND FORCE MISS AND FORCE REPLACE
                                        ;               BITS ARE RELEVANT)
                                        ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                        ;               UTRAP OCCURS
                                        ;       GOT CACHE MAINT REGISTER
                                        ;       EXPECTED READ DATA
                                        ;       GOT READ DATA
                                        ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;               FLAG            UTRAP TYPE
                                        ;               ----            ----------
                                        ;               1DE             NO UTRAP OCCURRED
                                        ;               DE              CACHE PARITY UTRAP
                                        ;               15E             TB PARITY ERROR
                                        ;               19E             TB MISS
                                        ;               1CE             TB PROTECTION ERROR
                                        ;               1D6             TB MODIFY BIT ERROR
                                        ;               1DA             X PAGE UTRAP
                                        ;               1DC             UNALIGNED DATA UTRAP
                                        ;
                                        ;--
                                        ;*******************************************************************
                                        =0
U 1176, 0000,003D,0180,0800,0000,1233   ADR2G0: NEWTST
U 1177, 0F18,0038,D580,09F8,0000,1178           D_0,RC[0F]_K[.6]
U 1178, 0000,003D,4980,3C00,0000,12A7   =0      ID[TBER0]_D,CALL,J/CAPAT ; TURN OFF TB AND GENERATE TEST DATA PATTERNS
U 1179, 0F00,003C,0180,0800,0000,117A           D_0
U 117A, 0000,003D,0180,0800,0000,1250   =0      CALL,J/DC.1DE           ; SET UP UTRAP FLAG
U 117B, 0001,003C,0180,0AF0,0000,117C           R[0E]_D
U 117C, 0000,003D,0180,0800,0000,1292   =0      CALL,J/SOFF             ; TURN OFF SBI CYCLES.
U 117D, 0018,0038,1980,0800,0200,131E           VA_K[ZERO]              ; INVALIDATE LOCATION 0 OF BOTH GROUPS
U 131E, 0000,003C,0180,9000,0000,131F           FS7MCT,MCT/INVALIDATE
U 131F, 0018,0038,1180,0800,0200,1320           VA_K[.4]                ; INVALIDATE LOCATION 4 OF BOTH GROUPS
U 1320, 0000,003C,0180,9000,0000,117E           FS7MCT,MCT/INVALIDATE
```

```
U 117E, 0000,003D,0180,0800,0000,1296   ;2800   =0      CALL,J/R0S                  ; SET FORCE REPLACE GROUP 0 BIT
U 117F, 0010,0038,0180,0908,0200,1321   ;2801           VA_RC[1]                    ; VA=19999000
U 1321, 0810,0038,0180,0900,0000,1322   ;2802           D_RC[0]                     ; DATA=AAAAAAAA
U 1322, 0000,003C,0180,9800,0000,1180   ;2803           FS/MCT,MCT/VALIDATE         ; WRITE GROUP 0
U 1180, 0000,003D,0180,0800,0000,129A   ;2804   =0      CALL,J/R1S                  ; SET FORCE REPLACE GROUP 1 BIT
U 1181, 0010,0038,0180,0918,0200,1323   ;2805           VA_RC[3]                    ; VA=06666000
U 1323, 0810,0038,0180,0910,0000,1324   ;2806           D_RC[2]                     ; DATA=55555555
U 1324, 0000,003C,0180,9800,0000,1182   ;2807           FS/MCT,MCT/VALIDATE         ; WRITE GROUP 1
U 1182, 0000,003D,0180,0800,0000,1292   ;2808   =0      CALL,J/SOFF                 ; TURN OFF FORCE REPLACE BITS
U 1183, 0810,0038,0180,0908,0200,1325   ;2809           VA_RC[1],D_RC[1]            ; WRITE DATA=99999999
U 1325, 0019,0014,1180,09F3,0000,1326   ;2810           VA_VA+4,ALU_D[A+B]K[.4],RC[0E]_ALU ; AT ADDRESS 19999004.
U 1326, 0810,0038,0180,0920,0000,1074   ;2811           D_RC[4]                     ; VA=1999004 IS A HIT IN 0
U 1074, 0000,003D,0180,0800,0000,128B   ;2812   =00     CALL,J/WRITE
U 1075, 0000,003D,0180,0800,0000,1247   ;2813           ERROR1                      ; UTRAPPED
U 1076, 0810,0038,0180,0908,0200,1077   ;2814           VA_RC[1],D_RC[1]            ; CHECK GROUP 0 HIT AT 19999000
U 1077, 0001,003C,0180,09F0,0000,1327   ;2815           RC[0E]_D
U 1327, 0010,0038,01C0,0900,0000,1078   ;2816           Q_RC[0]
U 1078, 0001,203D,0180,09D8,0000,111A   ;2817   =00     CALL,J/RHOM1,RC[0B]_Q
U 1079, 0000,003D,0180,0800,0000,1247   ;2818           ERROR1                      ; A UTRAP OCCURRED.
U 107A, 0000,003D,0180,0800,0000,1247   ;2819           ERROR1                      ; HIT/MISS BITS INCORRECT.
U 107B, 001D,2000,0180,0800,0010,1328   ;2820           ALU_Q-D,CLK.UBCC            ; CHECK DATA AT 19999000, =AAAAAAAA
U 1328, 0000,013C,0180,0800,0000,1184   ;2821           Z?
U 1184, 0000,003D,0180,0800,0000,1247   ;2822   =0      ERROR1                      ; GROUP ZERO DATA AT
                                        ;2823                                       ; ADDRESS VA<2>=0 INCORRECT
U 1185, 0810,0038,0180,090B,0000,1329   ;2824           VA_VA+4,D_RC[1] ; CHECK GROUP 0 HIT AT 19999004
U 1329, 0019,0014,1180,09F0,0000,132A   ;2825           ALU_D[A+B]K[.4],RC[0E]_ALU
U 132A, 0010,0038,01C0,0920,0000,107C   ;2826           Q_RC[4]
U 107C, 0001,203D,0180,09D8,0000,111A   ;2827   =00     CALL,J/RHOM1,RC[0B]_Q
U 107D, 0000,003D,0180,0800,0000,1247   ;2828           ERROR1                      ; AN UNEXPECTED UTRAP OCCURRED.
U 107E, 0000,003D,0180,0800,0000,1247   ;2829           ERROR1                      ; HIT/MISS BITS INCORRECT
U 107F, 001D,2000,0180,0800,0010,132B   ;2830           ALU_Q-D,CLK.UBCC            ; CHECK DATA AT 19999004, =99999999
U 132B, 0000,013C,0180,0800,0000,1186   ;2831           Z?
U 1186, 0000,003D,0180,0800,0000,1247   ;2832   =0      ERROR1                      ; GROUP ZERO DATA AT
                                        ;2833                                       ; ADDRESS VA<2>=1 INCORRECT
U 1187, 0810,0038,0180,0918,0200,132C   ;2834           VA_RC[3],D_RC[3]            ; CHECK GROUP 1 HIT AT 06666000
U 132C, 0001,003C,0180,09F0,0000,132D   ;2835           RC[0E]_D
U 132D, 0010,0038,01C0,0910,0000,1080   ;2836           Q_RC[2]
U 1080, 0001,203D,0180,09D8,0000,111C   ;2837   =00     CALL,J/RMOH1,RC[0B]_Q
U 1081, 0000,003D,0180,0800,0000,1247   ;2838           ERROR1                      ; AN UNEXPECTED UTRAP OCCURRED
U 1082, 0000,003D,0180,0800,0000,1247   ;2839           ERROR1                      ; HIT/MISS BITS INCORRECT.
U 1083, 001D,2000,0180,0800,0010,132E   ;2840           ALU_Q-D,CLK.UBCC            ; CHECK DATA AT 06666000, =55555555
U 132E, 0000,013C,0180,0800,0000,1188   ;2841           Z?
U 1188, 0000,003D,0180,0800,0000,1247   ;2842   =0      ERROR1
U 1189, 0000,003C,0180,0800,0000,118A   ;2843           NOP
```

```
                                      ;2844          .PAGE   "TEST DO        ADDRESS BIT 2 IN GROUP 1 TEST"
                                      ;2845   ;*****************************************************************
                                      ;2846   ;++
                                      ;2847   ; TEST  DO      ADDRESS BIT 2 IN GROUP 1 TEST
                                      ;2848   ;
                                      ;2849   ; TEST DESCRIPTION
                                      ;2850   ;       THIS IS A TEST OF ADDRESS BIT 2 IN GROUP 1.
                                      ;2851   ;
                                      ;2852   ; LOGIC DESCRIPTION
                                      ;2853   ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                      ;2854   ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                      ;2855   ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                      ;2856   ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                      ;2857   ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                      ;2858   ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                      ;2859   ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                      ;2860   ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                      ;2861   ;       REGISTER ON THE SBI CONTROL MODULE.
                                      ;2862   ;
                                      ;2863   ; ERROR DESCRIPTION
                                      ;2864   ;       VA REFERENCED
                                      ;2865   ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                      ;2866   ;               ONLY HIT/MISS, FORCE MISS AND FORCE REPLACE
                                      ;2867   ;               BITS ARE RELEVANT)
                                      ;2868   ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                      ;2869   ;               UTRAP OCCURS
                                      ;2870   ;       GOT CACHE MAINT REGISTER
                                      ;2871   ;       EXPECTED READ DATA
                                      ;2872   ;       GOT READ DATA
                                      ;2873   ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                      ;2874   ;               FLAG            UTRAP TYPE
                                      ;2875   ;               ----            ----------
                                      ;2876   ;               1DE             NO UTRAP OCCURRED
                                      ;2877   ;               DE              CACHE PARITY UTRAP
                                      ;2878   ;               15E             TB PARITY ERROR
                                      ;2879   ;               19E             TB MISS
                                      ;2880   ;               1CE             TB PROTECTION ERROR
                                      ;2881   ;               1D6             TB MODIFY BIT ERROR
                                      ;2882   ;               1DA             X PAGE UTRAP
                                      ;2883   ;               1DC             UNALIGNED DATA UTRAP
                                      ;2884   ;
                                      ;2885   ;--
                                      ;2886   ;*****************************************************************
                                      ;2887   =0
U 118A, 0000,003D,0180,0800,0000,1233 ;2888   ADR2G1: NEWTST
U 118B, 0F18,0038,D580,09F8,0000,118C ;2889          D_0,RC[0F]_K[.6]
U 118C, 0000,003D,4980,3C00,0000,12A7 ;2890   =0     ID[TBER0]_D,CALL,J/CAPAT ; TURN OFF THE TB AND GENERATE TEST DATA PATTERNS
U 118D, 0F00,003C,0180,0800,0000,118E ;2891          D_0
U 118E, 0000,003D,0180,0800,0000,1250 ;2892   =0     CALL,J/DC.1DE            ; SET UP UTRAP FLAG
U 118F, 0001,003C,0180,0AF0,C000,1190 ;2893          R[0E]_D
U 1190, 0000,003D,0180,0800,0000,1292 ;2894   =0     CALL,J/SOFF              ; TURN OFF SBI CYCLES
U 1191, 0018,0038,1980,0800,0200,132F ;2895          VA_K[ZERO]               ; INVALIDATE LOCATION 0 OF BOTH GROUPS
U 132F, 0000,003C,0180,9000,0000,1330 ;2896          FS7MCT,MCT/INVALIDATE
U 1330, 0018,0038,1180,0800,0200,1331 ;2897          VA_K[.4]
U 1331, 0000,003C,0180,9000,0000,1192 ;2898          FS7MCT,MCT/INVALIDATE    ; INVALIDATE LOCATION 4 OF BOTH GROUPS
```

```
U 1192, 0000,003D,0180,0800,0000,129A   ;2899   =0      CALL,J/R1S                ; FORCE REPLACE GROUP 1
U 1193, 0010,0038,0180,0908,0200,1332   ;2900           VA_RC[1]                  ; VA=19999000
U 1332, 0810,0038,0180,0900,0000,1333   ;2901           D_RC[0]                   ; DATA=AAAAAAAA
U 1333, 0000,003C,0180,9800,0000,1194   ;2902           FS/MCT,MCT/VALIDATE       ; WRITE GROUP 1
U 1194, 0000,003D,0180,0800,0000,1296   ;2903   =0      CALL,J/R0S                ; FORCE REPLACE GROUP 0
U 1195, 0010,0038,0180,0918,0200,1334   ;2904           VA_RC[3]                  ; VA=06666000
U 1334, 0810,0038,0180,0910,0000,1335   ;2905           D_RC[2]                   ; DATA=55555555
U 1335, 0000,003C,0180,9800,0000,1196   ;2906           FS/MCT,MCT/VALIDATE       ; WRITE GROUP 1
U 1196, 0000,003D,0180,0800,0000,1292   ;2907   =0      CALL,J/SOFF               ; TURN OFF FORCE REPLACE BIT
U 1197, 0810,0038,0180,0908,0200,1336   ;2908           VA_RC[1],D_RC[1]          ; WRITE DATA=99999999
U 1336, 0019,0014,1180,09F3,0000,1337   ;2909           VA_VA+4,ALU_D[A+B]K[.4],RC[0E]_ALU ; AT ADDRESS 19999004
U 1337, 0810,0038,0180,0920,0000,1084   ;2910           D_RC[4]                   ; 19999004 IS A HIT IN GROUP 1
U 1084, 0000,003D,0180,0800,0000,128B   ;2911   =00     CALL,J/WRITE
U 1085, 0000,003D,0180,0800,0000,1247   ;2912           ERROR1                    ; UTRAPPED
U 1086, 0810,0038,0180,0908,0200,1087   ;2913           VA_RC[1],D_RC[1]          ; CHECK GROUP 0 HIT AT 19999000
U 1087, 0001,003C,0180,09F0,0000,1338   ;2914           RC[0E]_D
U 1338, 0010,0038,01C0,0900,0000,1088   ;2915           Q_RC[0]
U 1088, 0001,203D,0180,09D8,0000,111C   ;2916   =00     CALL,J/RM0H1,RC[0B]_Q
U 1089, 0000,003D,0180,0800,0000,1247   ;2917           ERROR1                    ; UNEXPECTED UTRAP OCCURRED.
U 108A, 0000,003D,0180,0800,0000,1247   ;2918           ERROR1                    ; HIT/MISS BITS INCORRECT
U 108B, 001D,2000,0180,0800,0010,1339   ;2919           ALU_Q-D,CLK.UBCC          ; CHECK DATA AT 19999000, =AAAAAAAA
U 1339, 0000,013C,0180,0800,0000,1198   ;2920           Z?
U 1198, 0000,003D,0180,0800,0000,1247   ;2921   =0      ERROR1                    ; GROUP ONE DATA AT
                                        ;2922                                     ; ADDRESS VA<2>=0 INCORRECT
U 1199, 0810,0038,0180,090B,0000,133A   ;2923           VA_VA+4,D_RC[1] ; CHECK GROUP 1 HIT AT 19999004
U 133A, 0019,0014,1180,09F0,0000,133B   ;2924           ALU_D[A+B]K[.4],RC[0E]_ALU
U 133B, 0010,0038,01C0,0920,0000,108C   ;2925           Q_RC[4]
U 108C, 0001,203D,0180,09D8,0000,111C   ;2926   =00     CALL,J/RM0H1,RC[0B]_Q
U 108D, 0000,003D,0180,0800,0000,1247   ;2927           ERROR1                    ; UNEXPECTED UTRAP OCCURRED.
U 108E, 0000,003D,0180,0800,0000,1247   ;2928           ERROR1                    ; HIT/MISS BITS INCORRECT
U 108F, 001D,2000,0180,0800,0010,133C   ;2929           ALU_Q-D,CLK.UBCC          ; CHECK DATA AT 19999004, =99999999
U 133C, 0000,013C,0180,0800,0000,119A   ;2930           Z?
U 119A, 0000,003D,0180,0800,0000,1247   ;2931   =0      ERROR1                    ; GROUP ONE DATA AT
                                        ;2932                                     ; ADDRESS VA<2>=1 INCORRECT
U 119B, 0810,0038,0180,0918,0200,133D   ;2933           VA_RC[3],D_RC[3]          ; CHECK GROUP 0 HIT AT 06666000
U 133D, 0001,003C,0180,09F0,0000,133E   ;2934           RC[0E]_D
U 133E, 0010,0038,01C0,0910,0000,1090   ;2935           Q_RC[2]
U 1090, 0001,203D,0180,09D8,0000,111A   ;2936   =00     CALL,J/RH0M1,RC[0B]_Q
U 1091, 0000,003D,0180,0800,0000,1247   ;2937           ERROR1                    ; UNEXPECTED UTRAP OCCURRED.
U 1092, 0000,003D,0180,0800,0000,1247   ;2938           ERROR1                    ; HIT/MISS BITS INCORRECT
U 1093, 001D,2000,0180,0800,0010,133F   ;2939           ALU_Q-D,CLK.UBCC          ; CHECK DATA AT 06666000, =55555555
U 133F, 0000,013C,0180,0800,0000,119C   ;2940           Z?
U 119C, 0000,003D,0180,0800,0000,1247   ;2941   =0      ERROR1
U 119D, 0000,003C,0180,0800,0000,119E   ;2942           NOP
```

```
                                                .PAGE   "TEST D1        DATA PATH TO GROUP 0 TEST"
                                        ;********************************************************************
                                        ;++
                                        ; TEST  D1      DATA PATH TO GROUP 0 TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF DATA LOCATION 0 (PA<11:02>=0) IN THE DATA
                                        ;       MEMORY OF GROUP ZERO. A ONE IS FLOATED THROUGH A FIELD OF ZEROES AND A ZERO
                                        ;       IS FLOATED THROUGH A FIELD OF ONES TO GENERATE THE
                                        ;       TEST DATA PATTERNS.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;       IF THE APPROPRIATE HIT SIGNAL IS INCCRRECT FROM THAT MODULE;
                                        ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       VA REFERENCED
                                        ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                        ;               ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
                                        ;               BITS ARE RELEVANT)
                                        ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                        ;               UTRAP OCCURS
                                        ;       GOT CACHE MAINT REGISTER
                                        ;       EXPECTED READ DATA
                                        ;       GOT READ DATA
                                        ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;               FLAG            UTRAP TYPE
                                        ;               ----            ----------
                                        ;               1DE             NO UTRAP OCCURRED
                                        ;               DE              CACHE PARITY UTRAP
                                        ;               15E             TB PARITY ERROR
                                        ;               19E             TB MISS
                                        ;               1CE             TB PROTECTION ERROR
                                        ;               1D6             TB MODIFY BIT ERROR
                                        ;               1DA             X PAGE UTRAP
                                        ;               1DC             UNALIGNED DATA UTRAP
                                        ;
                                        ;--
                                        ;********************************************************************
                                        =0
U 119E, 0000,003D,0180,0800,0000,1233   DATGO:  NEWTST
U 119F, 0F18,0038,D580,09F8,0000,11A0           D_0,RC[OF]_K[.6]
U 11A0, 0000,003D,0180,0800,0000,1250   =0      CALL,J/DC.TDE           ; SET UP UTRAP FLAG.
U 11A1, 0001,003C,0180,0AF0,0000,1340           R[OE]_D
U 1340, 0F00,003C,0180,0800,0000,11A2           D_0
U 11A2, 0000,003D,4980,3C00,0000,12A7   =0      ID[TBERO]_D,CALL,J/CAPAT ; TURN TB OFF AND GET TEST PATTERNS
U 11A3, 0018,0038,1980,0800,0200,1341           VA_K[ZERO]              ; INVALIDATE LOCATION 0 IN BOTH GROUPS.
U 1341, 0000,003C,0180,9000,0000,11A4           FS7MCT,MCT/INVALIDATE
```

```
U 11A4, 0000,003D,0180,0800,0000,1296   ;2998   =0      CALL,J/R0S                  ; SET FORCE REPLACE GROUP 0 BIT
U 11A5, 0010,0038,0180,0908,0200,1342   ;2999           VA_RC[1]                    ; VA=19999000
U 1342, 0810,0038,0180,0900,0000,1343   ;3000           D_RC[0]                     ; DATA=AAAAAAAA
U 1343, 0000,003C,0180,9800,0000,11A6   ;3001           FS/MCT,MCT/VALIDATE         ; WRITE GROUP 0.
U 11A6, 0000,003D,0180,0800,0000,129A   ;3002   =0      CALL,J/R1S                  ; SET FORCE REPLACE GROUP 1 BIT
U 11A7, 0010,0038,0180,0918,0200,1344   ;3003           VA_RC[3]                    ; VA=06666000
U 1344, 0810,0038,0180,0910,0000,1345   ;3004           D_RC[2]                     ; DATA=55555555
U 1345, 0000,003C,0180,9800,0000,11A8   ;3005           FS/MCT,MCT/VALIDATE         ; WRITE GROUP 1.
U 11A8, 0000,003D,0180,0800,0000,1292   ;3006   =0      CALL,J/SOFF                 ; CLEAR FORCE REPLACE BITS.
U 11A9, 0018,0038,8D80,0A80,0000,11AA   ;3007           R[0]_K[.1F]                 ; SET UP THE TEST DATA COUNTER.
U 11AA, 0000,003D,0180,0800,0000,1246   ;3008   =0      ERLOOP
U 11AB, 0000,003C,0180,0A00,0082,1346   ;3009   DATG0A: SC_R[0]                     ; USE THE MASK TO GENERATE THE
                                        ;3010                                       ; TEST DATA, 1 IN 0'S
U 1346, 0810,0038,0180,0908,0200,1347   ;3011           VA_RC[1],D_RC[1]            ; VA=19999000, WHICH IS A HIT IN 0
U 1347, 0001,003C,0180,09F0,0000,1348   ;3012           RC[0E]_D
U 1348, 0803,001C,0180,09D8,0000,1094   ;3013           ALU_NOT.MASK,RC[0B]_ALU,D_ALU
U 1094, 0000,003D,0180,0800,0000,128B   ;3014   =00     CAL[,J/WRITE                ; WRITE GROUP 0.
U 1095, 0000,003D,0180,0800,0000,1247   ;3015           ERROR1                      ; UNEXPECTED UTRAP OCCURRED.
U 1096, 081B,0000,0580,0800,0000,1098   ;3016           ALU_0-K[.1],D_ALU
                                        ;3017   =
U 1098, 0000,003D,0180,0800,0000,111A   ;3018   =00     CALL,J/RHOM1                ; CHECK GROUP 0 HIT AT 19999000
U 1099, 0000,003D,0180,0800,0000,1247   ;3019           ERROR1                      ; UNEXPECTED UTRAP OCCURRED.
U 109A, 0000,003D,0180,0800,0000,1247   ;3020           ERROR1                      ; HIT/MISS BITS INCORRECT
U 109B, 0010,0038,01C0,0958,0000,1349   ;3021           Q_RC[0B]                            ; CHECK DATA AT 19999000, 1 IN 0'S.
U 1349, 001D,2000,0180,0800,0010,134A   ;3022           A[U_Q-D,CLK.UBCC
U 134A, 0000,013C,0180,0800,0000,11AC   ;3023           Z?
U 11AC, 0000,003D,0180,0800,0000,1247   ;3024   =0      ERROR1                      ; DATA AT 19999000 INCORRECT
U 11AD, 0000,003C,0180,0A00,0082,134B   ;3025           SC_R[0]                     ; USE THE MASK TO GENERATE THE TEST
                                        ;3026                                       ; DATA, A 0 IN 1'S.
U 134B, 0810,0038,0180,0908,0200,134C   ;3027           VA_RC[1],D_RC[1]                    ; VA=19999000
U 134C, 0001,003C,0180,09F0,0000,134D   ;3028           RC[0E]_D
U 134D, 0800,0038,0180,09D8,0000,109C   ;3029           ALU_MASK,RC[0B]_ALU,D_ALU
U 109C, 0000,003D,0180,0800,0000,128B   ;3030   =00     CAL[,J/WRITE                ; WRITE GROUP 0
U 109D, 0000,003D,0180,0800,0000,1247   ;3031           ERROR1                      ; UNEXPECTED UTRAP OCCURRED.
U 109E, 0F00,003C,0180,0800,0000,10A0   ;3032           D_0
                                        ;3033   =
U 10A0, 0000,003D,0180,0800,0000,111A   ;3034   =00     CALL,J/RHOM1                ; CHECK GROUP 0 HIT AT 19999000
U 10A1, 0000,003D,0180,0800,0000,1247   ;3035           ERROR1                      ; UNEXPECTED UTRAP OCCURRED.
U 10A2, 0000,003D,0180,0800,0000,1247   ;3036           ERROR1                      ; HIT/MISS BITS INCORRECT
U 10A3, 0010,0038,01C0,0958,0000,134E   ;3037           Q_RC[0B]                            ; CHECK DATA AT 19999000, =0 IN 1'S
U 134E, 001D,2000,0180,0800,0010,134F   ;3038           A[U_Q-D,CLK.UBCC
U 134F, 0000,013C,0180,0800,0000,11AE   ;3039           Z?
U 11AE, 0000,003D,0180,0800,0000,1247   ;3040   =0      ERROR1                      ; DATA INCORRECT AT 19999000
U 11AF, 0000,003C,0180,0A00,0010,1350   ;3041           ALU_R[0],CLK.UBCC           : TRIED ALL TEST PATTERNS?
U 1350, 0000,013C,0180,0800,0000,11B0   ;3042           Z?
U 11B0, 0018,0000,0580,0A80,0000,11AB   ;3043   =0      R[0]_LA-K[.1],J/DATG0A ; IF NOT CONTINUE.
U 11B1, 0810,0038,0180,0918,0200,1351   ;3044           VA_RC[3],D_RC[3]            ; CHECK GROUP 1 HIT AT 06666000
U 1351, 0001,003C,0180,09F0,0000,1352   ;3045           RC[0E]_D
U 1352, 0010,0038,01C0,0910,0000,10A4   ;3046           Q_RC[2]
U 10A4, 0001,203D,0180,09D8,0000,111C   ;3047   =00     CALL,J/RMOH1,RC[0B]_Q
U 10A5, 0000,003D,0180,0800,0000,1247   ;3048           ERROR1                      ; UNEXPECTED UTRAP OCCURRED.
U 10A6, 0000,003D,0180,0800,0000,1247   ;3049           ERROR1                      ; HIT/MISS BITS INCORRECT
U 10A7, 001D,2000,0180,0800,0010,1353   ;3050           ALU_Q-D,CLK.UBCC            ; CHECK DATA AT 06666000, =55555555
U 1353, 0000,013C,0180,0800,0000,11B2   ;3051           Z?
U 11B2, 0000,003D,0180,0800,0000,1247   ;3052   =0      ERROR1
```

```
U 11B3, 0000,003C,0180,0800,0000,11B4   ;3053           NOP
```

```
                                         ;3054           .PAGE   "TEST D2        DATA PATH TO GROUP 1 TEST"
                                         ;3055   ;*******************************************************************
                                         ;3056   ;++
                                         ;3057   ; TEST  D2      DATA PATH TO GROUP 1 TEST
                                         ;3058   ;
                                         ;3059   ; TEST DESCRIPTION
                                         ;3060   ;       THIS IS A TEST OF LOCATION ZERO (PA<11:3>=0) IN
                                         ;3061   ;       GROUP ONE. A ONE IS FLOATED THROUGH A FIELD OF ZEROES
                                         ;3062   ;       AND A ZERO IS FLOATED THROUGH A FIELD OF ONES TO GENERATE
                                         ;3063   ;       THE TEST DATA PATTERNS.
                                         ;3064   ;
                                         ;3065   ; LOGIC DESCRIPTION
                                         ;3066   ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                         ;3067   ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                         ;3068   ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                         ;3069   ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                         ;3070   ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                         ;3071   ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                         ;3072   ;       IF THE APPROPRIATE HIT SIGNAL IS INCCRRECT FROM THAT MODULE;
                                         ;3073   ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                         ;3074   ;       REGISTER ON THE SBI CONTROL MODULE.
                                         ;3075   ;
                                         ;3076   ; ERROR DESCRIPTION
                                         ;3077   ;       VA REFERENCED
                                         ;3078   ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                         ;3079   ;               ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
                                         ;3080   ;               BITS ARE RELEVANT)
                                         ;3081   ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                         ;3082   ;               UTRAP OCCURS
                                         ;3083   ;       GOT CACHE MAINT REGISTER
                                         ;3084   ;       EXPECTED READ DATA
                                         ;3085   ;       GOT READ DATA
                                         ;3086   ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                         ;3087   ;               FLAG            UTRAP TYPE
                                         ;3088   ;               ----            ----------
                                         ;3089   ;               1DE             NO UTRAP OCCURRED
                                         ;3090   ;               DE              CACHE PARITY UTRAP
                                         ;3091   ;               15E             TB PARITY ERROR
                                         ;3092   ;               19E             TB MISS
                                         ;3093   ;               1CE             TB PROTECTION ERROR
                                         ;3094   ;               1D6             TB MODIFY BIT ERROR
                                         ;3095   ;               1DA             X PAGE UTRAP
                                         ;3096   ;               1DC             UNALIGNED DATA UTRAP
                                         ;3097   ;
                                         ;3098   ;--
                                         ;3099   ;*******************************************************************
                                         ;3100   =0
U 11B4, 0000,003D,0180,0800,0000,1233    ;3101   DATG1:  NEWTST
U 11B5, 0F18,0038,D580,09F8,0000,11B6    ;3102           D_0,RC[0F]_K[.6]
U 11B6, 0000,003D,0180,0800,0000,1250    ;3103   =0      CALL,J/DC.1DE           ; SET THE UTRAP FLAG
U 11B7, 0001,003C,0180,0AF0,0000,1354    ;3104           R[0E]_D
U 1354, 0F00,003C,0180,0800,0000,11B8    ;3105           D_0
U 11B8, 0000,003D,4980,3C00,0000,12A7    ;3106   =0      ID[TBER0]_D,CALL,J/CAPAT ; TURN OFF TB AND GET TEST PATTERNS
U 11B9, 0018,0038,1980,0800,0200,1355    ;3107           VA_K[ZERO]              ; INVALIDATE LOCATION 0 IN BOTH GROUPS.
U 1355, 0000,003C,0180,9000,0000,11BA    ;3108           FS7MCT,MCT/INVALIDATE
```

```
U 11BA, 0000,003D,0180,0800,0000,1296   ;3109    =0       CALL,J/ROS                ; SET FORCE REPLACE GROUP 0 BIT
U 11BB, 0010,0038,0180,0928,0200,1356   ;3110             VA_RC[5]                  ; VA=1B6DB000
U 1356, 0810,0038,0180,0920,0000,1357   ;3111             D_RC[4]                   ; DATA=99999999
U 1357, 0000,003C,0180,9800,0000,11BC   ;3112             FS/MCT,MCT/VALIDATE       ; WRITE GROUP 0.
U 11BC, 0000,003D,0180,0800,0000,129A   ;3113    =0       CALL,J/R1S                ; SET FORCE REPLACE GROUP 1 BIT.
U 11BD, 0010,0038,0180,0938,0200,1358   ;3114             VA_RC[7]                  ; VA=4924000
U 1358, 0810,0038,0180,0930,0000,1359   ;3115             D_RC[6]                   ; DATA=66666666
U 1359, 0000,003C,0180,9800,0000,11BE   ;3116             FS/MCT,MCT/VALIDATE       ; WRITE GROUP 1
U 11BE, 0000,003D,0180,0800,0000,1292   ;3117    =0       CALL,J/SOFF               ; CLEAR FORCE REPLACE BITS.
U 11BF, 0018,0038,8D80,0A80,0000,11C0   ;3118             R[0]_K[.1F]               ; INIATILZE A COUNTER.
U 11C0, 0000,003D,0180,0800,0000,1246   ;3119    =0       ERLOOP
U 11C1, 0000,003C,0180,0A00,0082,135A   ;3120    DATG1A:  SC_R[0]                   ; USE THE MASK TO GENERATE
                                        ;3121                                       ; THE TEST DATA, =1 IN 0'S.
U 135A, 0810,0038,0180,0938,0200,135B   ;3122             VA_RC[7],D_RC[7]          ; VA=04924000, A HIT IN GROUP 1.
U 135B, 0001,003C,0180,09F0,0000,135C   ;3123             RC[0E]_D
U 135C, 0803,001C,0180,09D8,0000,10A8   ;3124             ALU_NOT.MASK,RC[0B]_ALU,D_ALU
U 10A8, 0000,003D,0180,0800,0000,128B   ;3125    =00      CALL,J/WRITE              ; WRITE TEST DATA.
U 10A9, 0000,003D,0180,0800,0000,1247   ;3126             ERROR1                    ; UNEXPECTED UTRAP OCCURRED.
U 10AA, 081B,0000,0580,0800,0000,10AC   ;3127             ALU_0-K[.1],D_ALU
                                        ;3128    =
U 10AC, 0000,003D,0180,0800,0000,111C   ;3129    =00      CALL,J/RMOH1              ; CHECK GROUP 1 HIT AT 04924000
U 10AD, 0000,003D,0180,0800,0000,1247   ;3130             ERROR1                    ; UNEXPECTED UTRAP OCCURRED.
U 10AE, 0000,003D,0180,0800,0000,1247   ;3131             ERROR1                    ; HIT/MISS BITS INCORRECT
U 10AF, 0010,0038,01C0,0958,0000,135D   ;3132             Q_RC[0B]                          ; CHECK DATA AT 04924000, = 1 IN 0'S
U 135D, 001D,2000,0180,0800,0010,135E   ;3133             ALU_Q-D,CLK.UBCC
U 135E, 0000,013C,0180,0800,0000,11C2   ;3134             Z?
U 11C2, 0000,003D,0180,0800,0000,1247   ;3135    =0       ERROR1                    ; DATA AT 04924000 INCORRECT.
U 11C3, 0000,003C,0180,0A00,0082,135F   ;3136             SC_R[0]                   ; USE THE MASK TO GENERATE THE TEST
                                        ;3137                                       ; DATA PATTERN, = 0 IN 1'S
U 135F, 0810,0038,0180,0938,0200,1360   ;3138             VA_RC[7],D_RC[7]          ; VA=04924000
U 1360, 0001,003C,0180,09F0,0000,1361   ;3139             RC[0E]_D
U 1361, 0800,0038,0180,09D8,0000,10B0   ;3140             ALU_MASK,RC[0B]_ALU,D_ALU
U 10B0, 0000,003D,0180,0800,0000,128B   ;3141    =00      CALL,J/WRITE              ; WRITE GROUP 1
U 10B1, 0000,003D,0180,0800,0000,1247   ;3142             ERROR1                    ; UNEXPECTED UTRAP OCCURRED.
U 10B2, 0F00,003C,0180,0800,0000,10B4   ;3143             D_0
                                        ;3144    =
U 10B4, 0000,003D,0180,0800,0000,111C   ;3145    =00      CALL,J/RMOH1              ; CHECK THE GROUP 1 HIT AT 04924000
U 10B5, 0000,003D,0180,0800,0000,1247   ;3146             ERROR1                    ; UNEXPECTED UTRAP OCCURRED.
U 10B6, 0000,003D,0180,0800,0000,1247   ;3147             ERROR1                    ; HIT/MISS BITS INCORRECT
U 10B7, 0010,0038,01C0,0958,0000,1362   ;3148             Q_RC[0B]                  ; CHECK THE DATA AT 04924, = 0 IN 1'S
U 1362, 001D,2000,0180,0800,0010,1363   ;3149             ALU_Q-D,CLK.UBCC
U 1363, 0000,013C,0180,0800,0000,11C4   ;3150             Z?
U 11C4, 0000,003D,0180,0800,0000,1247   ;3151    =0       ERROR1                    ; DATA AT 04924000 INCORRECT.
U 11C5, 0000,003C,0180,0A00,0010,1364   ;3152             ALU_R[0],CLK.UBCC         ; TRIED ALL TEST PATTERNS?
U 1364, 0000,013C,0180,0800,0000,11C6   ;3153             Z?
U 11C6, 0018,0000,0580,0A80,0000,11C1   ;3154    =0       R[0]_LA-K[.1],J/DATG1A ; IF NOT CONTINUE
U 11C7, 0810,0038,0180,0928,0200,1365   ;3155             VA_RC[5],D_RC[5]          ; VA=1B6DB000
U 1365, 0001,003C,0180,09F0,0000,1366   ;3156             RC[0E]_D
U 1366, 0010,0038,01C0,0920,0000,10B8   ;3157             Q_RC[4]
U 10B8, 0001,203D,0180,09D8,0000,111A   ;3158    =00      CALL,J/RHOM1,RC[0B]_Q     ; CHECK THE GROUP 0 HIT AT 1B6DB000
U 10B9, 0000,003D,0180,0800,0000,1247   ;3159             ERROR1                    ; UNEXPECTED UTRAP OCCURRED.
U 10BA, 0000,003D,0180,0800,0000,1247   ;3160             ERROR1                    ; HIT/MISS BITS INCORRECT
U 10BB, 001D,2000,0180,0800,0010,1367   ;3161             ALU_Q-D,CLK.UBCC          ; CHECK THE DATA AT 1B6DB000, =99999999
U 1367, 0000,013C,0180,0800,0000,11C8   ;3162             Z?
U 11C8, 0000,003D,0180,0800,0000,1247   ;3163    =0       ERROR1
```

```
U 11C9, 0000,003C,0180,0800,0000,11CA    ;3164            NOP
```

```
                                              .PAGE   "TEST D3        ADDRESS PATH TO GROUP 0 TAG MEMORY TEST"
                                      ;*******************************************************************
                                      ;++
                                      ; TEST  D3      ADDRESS PATH TO GROUP 0 TEST
                                      ;
                                      ; TEST DESCRIPTION
                                      ;       THIS IS A TEST OF LOCATION ZERO (PA<11:03>=0) IN THE ADDRESS
                                      ;       MEMORY OF GROUP 0. TAGS WILL BE GENERATED BE FLOATING
                                      ;       A ONE THROUGH A FIELD OF ZEROES AND A ZERO THROUGH A FIELD OF ONES.
                                      ;
                                      ; LOGIC DESCRIPTION
                                      ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                      ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                      ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                      ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                      ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                      ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                      ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                      ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                      ;       REGISTER ON THE SBI CONTROL MODULE.
                                      ;
                                      ; ERROR DESCRIPTION
                                      ;       VA REFERENCED
                                      ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                      ;               ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
                                      ;               BITS ARE RELEVANT)
                                      ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                      ;               UTRAP OCCURS
                                      ;       GOT CACHE MAINT REGISTER
                                      ;       EXPECTED READ DATA
                                      ;       GOT READ DATA
                                      ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                      ;               FLAG            UTRAP TYPE
                                      ;               ----            ----------
                                      ;               1DE             NO UTRAP OCCURRED
                                      ;               DE              CACHE PARITY UTRAP
                                      ;               15E             TB PARITY ERROR
                                      ;               19E             TB MISS
                                      ;               1CE             TB PROTECTION ERROR
                                      ;               1D6             TB MODIFY BIT ERROR
                                      ;               1DA             X PAGE UTRAP
                                      ;               1DC             UNALIGNED DATA UTRAP
                                      ;
                                      ;--
                                      ;*******************************************************************
                                      =0
U 11CA, 0000,003D,0180,0800,0000,1233 ADRG0:  NEWTST
U 11CB, 0F18,0038,D580,09F8,0000,11CC         D_0,RC[0F]_K[.6]
U 11CC, 0000,003D,0180,0800,0000,1250 =0      CALL,J/DC.TDE           ; INITIALIZE THE UTRAP FLAG
U 11CD, 0001,003C,0180,0AF0,0000,1368         R[0E]_D
U 1368, 0F00,003C,0180,0800,0000,11CE         D_0
U 11CE, 0000,003D,4980,3C00,0000,12A7 =0      ID[TBER0]_D,CALL,J/CAPAT ; TB OFF AND GENERATE SOME CONSTANTS
U 11CF, 0018,0038,1980,0800,0200,1369         VA_K[ZERO]              ; INVALIDATE LOCATION 0 IN BOTH GROUPS
U 1369, 0000,003C,0180,9000,0000,11D0         FS7MCT,MCT/INVALIDATE
U 11D0, 0000,003D,0180,0800,0000,1296 =0      CALL,J/ROS              ; SET FORCE REPLACE GROUP 0 BIT
```

```
U 11D1, 0010,0038,0180,0918,0200,136A   ;3220             VA_RC[3]                     ; VA=06666000
U 136A, 0810,0038,0180,0910,0000,136B   ;3221             D_RC[2]                      ; DATA=55555555
U 136B, 0000,003C,0180,9800,0000,11D2   ;3222             FS/MCT,MCT/VALIDATE          ; WRITE GROUP 0
U 11D2, 0000,003D,0180,0800,0000,129A   ;3223   =0        CALL,J/R1S                   ; SET FORCE REPLACE GROUP 1 BIT
U 11D3, 0010,0038,0180,0908,0200,136C   ;3224             VA_RC[1]                     ; VA=19999000
U 136C, 0810,0038,0180,0900,0000,136D   ;3225             D_RC[0]                      ; DATA=AAAAAAAA
U 136D, 0000,003C,0180,9800,0000,11D4   ;3226             FS/MCT,MCT/VALIDATE          ; WRITE GROUP 1
U 11D4, 0000,003D,0180,0800,0000,1292   ;3227   =0        CALL,J/SOFF                  ; CLEAR FORCE REPLACE BITS
U 11D5, 0018,0038,6580,0A80,0000,136E   ;3228             R[0]_K[.10]                  ; INITIALIZE A COUNTER
U 136E, 0000,003C,6180,0800,0084,736F   ;3229             SC_K[.F]                     ; GENERATE AN ADDRESS MASK
U 136F, 0803,0010,0180,0800,0000,1370   ;3230             ALU_MASK+1,D_ALU
U 1370, 0200,003C,0180,0800,0000,1371   ;3231             D_D.RIGHT2,SI/ZERO
U 1371, 0600,003C,0180,0800,0000,1372   ;3232             D_D.RIGHT,SI/ZERO
U 1372, 0001,003C,0180,0A88,0000,11D6   ;3233             R[1]_D                       ; R[1]=1FFFE000
U 11D6, 0000,003D,0180,0800,0000,1246   ;3234   =0        ERLOOP
U 11D7, 0800,003C,0180,0A00,0000,1373   ;3235   ADRG0A:   D_R[0]                       ; GENERATE TEST ADDRESS
U 1373, 0018,0038,85C0,0800,0000,1374   ;3236             Q_K[.C]                      ; ADDRESS= 1 IN 0'S PATTERN
U 1374, 001D,2014,0180,0A90,0082,1375   ;3237             ALU_Q+D,SC_ALU,R[2]_ALU
U 1375, 0800,0024,0180,0A08,0200,1376   ;3238             ALU_R[1].ANDNOT.MASK,VA_ALU,D_ALU
U 1376, 0001,003C,0180,09F0,0000,11D8   ;3239             RC[0E]_D
U 11D8, 0000,003D,0180,0800,0000,1296   ;3240   =0        CALL,J/R0S                   ; SET FORCE REPLACE GROUP 0 BIT
U 11D9, 0810,0038,0180,0920,0000,1377   ;3241             D_RC[4]                      ; DATA=99999999
U 1377, 0000,003C,0180,9800,0000,11DA   ;3242             FS/MCT,MCT/VALIDATE          ; WRITE GROUP 0
U 11DA, 0000,003D,0180,0800,0000,1292   ;3243   =0        CALL,J/SOFF                  ; CLEAR FORCE REPLACE BITS
U 11DB, 0010,0038,01C0,0920,0000,10BC   ;3244             Q_RC[4]
U 10BC, 0F01,203D,0180,09D8,0000,111A   ;3245   =00       D_0,CALL,J/RHOM1,RC[0B]_Q ; CHECK FOR HIT IN GROUP 0 AT TEST ADDRESS
U 10BD, 0000,003D,0180,0800,0000,1247   ;3246             ERROR1                       ; UNEXPECTED UTRAP OCCURRED
U 10BE, 0000,003D,0180,0800,0000,1247   ;3247             ERROR1                       ; HIT/MISS BITS INCORRECT
U 10BF, 001D,2000,0180,0800,0010,1378   ;3248             ALU_Q-D,CLK.UBCC             ; CHECK THAT THE DATA=99999999
U 1378, 0000,013C,0180,0800,0000,11DC   ;3249             Z?
U 11DC, 0000,003D,0180,0800,0000,1247   ;3250   =0        ERROR1                       ; DATA INCORRECT
U 11DD, 0000,003C,0180,0A10,0082,1379   ;3251             SC_R[2]                      ; NOW TRY 0 IN 1'S PATTERN
U 1379, 0800,0034,0180,0A08,0200,137A   ;3252             ALU_R[1].AND.MASK,VA_ALU,D_ALU
U 137A, 0001,003C,0180,09F0,0000,11DE   ;3253             RC[0E]_D
U 11DE, 0000,003D,0180,0800,0000,1296   ;3254   =0        CALL,J/R0S                   ; SET FORCE REPLACE GROUP 0 BIT
J 11DF, 0810,0038,0180,0930,0000,137B   ;3255             D_RC[6]                      ; DATA=66666666
U 137B, 0000,003C,0180,9800,0000,11E0   ;3256             FS/MCT,MCT/VALIDATE          ; WRITE GROUP 0
U 11E0, 0000,003D,0180,0800,0000,1292   ;3257   =0        CALL,J/SOFF                  ; CLEAR FORCE REPLACE BITS.
U 11E1, 0F00,003C,0180,0800,0000,137C   ;3258             D_0
U 137C, 0010,0038,01C0,0930,0000,10C0   ;3259             Q_RC[6]
U 10C0, 0001,203D,0180,09D8,0000,111A   ;3260   =00       CALL,J/RHOM1,RC[0B]_Q        ; CHECK GROUP 0 HIT AT TEST ADDRESS
U 10C1, 0000,003D,0180,0800,0000,1247   ;3261             ERROR1                       ; UNEXPECTED UTRAP OCCURRED
U 10C2, 0000,003D,0180,0800,0000,1247   ;3262             ERROR1                       ; HIT/MISS BITS INCORRECT
U 10C3, 001D,2000,0180,0800,0010,137D   ;3263             ALU_Q-D,CLK.UBCC             : CHECK DATA=66666666
U 137D, 0000,013C,0180,0800,0000,11E2   ;3264             Z?
U 11E2, 0000,003D,0180,0800,0000,1247   ;3265   =0        ERROR1                       ; DATA INCORRECT
U 11E3, 0000,003C,0180,0A00,0010,137E   ;3266             ALU_R[0],CLK.UBCC            ; TRIED ALL TEST PATTERNS?
U 137E, 0000,013C,0180,0800,0000,11E4   ;3267             Z?
U 11E4, 0018,0000,0580,0A80,0000,11D7   ;3268   =0        R[0]_LA-K[.1],J/ADRG0A       ; IF NOT CONTINUE
U 11E5, 0810,0038,0180,0908,0200,137F   ;3269             VA_RC[1],D_RC[1]                     ; VA=19999000, SHOULD STILL BE A HIT IN
U 137F, 0001,003C,0180,09F0,0000,1380   ;3270             RC[0E]_D                     ; GROUP 1.
U 1380, 0010,0038,01C0,0900,0000,10C4   ;3271             Q_RC[0]
U 10C4, 0001,203D,0180,09D8,0000,111C   ;3272   =00       CALL,J/RMOH1,RC[0B]_Q
U 10C5, 0000,003D,0180,0800,0000,1247   ;3273             ERROR1                       ; UNEXPECTED UTRAP OCCURRED
U 10C6, 0000,003D,0180,0800,0000,1247   ;3274             ERROR1                       ; HIT/MISS BITS INCORRECT
```

```
U 10C7, 001D,2000,0180,0800,0010,1381   ;3275            ALU_Q-D,CLK.UBCC          ; CHECK DATA AT 19999000, =AAAAAAAA
U 1381, 0000,013C,0180,0800,0000,11E6   ;3276            Z?
U 11E6, 0000,003D,0180,0800,0000,1247   ;3277   =0       ERROR1                    ; DATA INCORRECT
U 11E7, 0000,003C,0180,0800,0000,11E8   ;3278            NOP
```

```
                                    ;3279        .PAGE   "TEST D4       ADDRESS PATH TO GROUP 1 TAG MEMORY TEST"
                                    ;3280   ;*************************************************************************
                                    ;3281   ;++
                                    ;3282   ; TEST  D4      ADDRESS PATH TO GROUP 1 TEST
                                    ;3283   ;
                                    ;3284   ; TEST DESCRIPTION
                                    ;3285   ;       THIS IS A TEST OF LOCATION ZERO (PA<11:03>=0) IN THE
                                    ;3286   ;       ADDRESS MEMORY OF GROUP ONE. TAGS USED AS TEST PATTERN ARE
                                    ;3287   ;       GENERATED BY FLOATING A ZERO THROUGH A FIELD OF ONES
                                    ;3288   ;       AND A ONE THROUGH A FIELD OF ZEROES.
                                    ;3289   ;
                                    ;3290   ; LOGIC DESCRIPTION
                                    ;3291   ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                    ;3292   ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                    ;3293   ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                    ;3294   ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                    ;3295   ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                    ;3296   ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                    ;3297   ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                    ;3298   ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                    ;3299   ;       REGISTER ON THE SBI CONTROL MODULE.
                                    ;3300   ;
                                    ;3301   ; ERROR DESCRIPTION
                                    ;3302   ;       VA REFERENCED
                                    ;3303   ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                    ;3304   ;               ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
                                    ;3305   ;               BITS ARE RELEVANT)
                                    ;3306   ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                    ;3307   ;               UTRAP OCCURS
                                    ;3308   ;       GOT CACHE MAINT REGISTER
                                    ;3309   ;       EXPECTED READ DATA
                                    ;3310   ;       GOT READ DATA
                                    ;3311   ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                    ;3312   ;               FLAG            UTRAP TYPE
                                    ;3313   ;               ----            ----------
                                    ;3314   ;               1DE             NO UTRAP OCCURRED
                                    ;3315   ;               DE              CACHE PARITY UTRAP
                                    ;3316   ;               15E             TB PARITY ERROR
                                    ;3317   ;               19E             TB MISS
                                    ;3318   ;               1CE             TB PROTECTION ERROR
                                    ;3319   ;               1D6             TB MODIFY BIT ERROR
                                    ;3320   ;               1DA             X PAGE UTRAP
                                    ;3321   ;               1DC             UNALIGNED DATA UTRAP
                                    ;3322   ;
                                    ;3323   ;--
                                    ;3324   ;*************************************************************************
                                    ;3325   =0
U 11E8, 0000,003D,0180,0800,0000,1233 ;3326   ADRG1:  NEWTST
U 11E9, 0F18,0038,D580,09F8,0000,11EA ;3327           D_0,RC[0F]_K[.6]
U 11EA, 0000,003D,0180,0800,0000,1250 ;3328   =0      CALL,J/DC.1DE           ; INITIALIZE THE UTRAP FLAG
U 11EB, 0001,003C,0180,0AF0,0000,1382 ;3329           R[0E]_D
U 1382, 0F00,003C,0180,0800,0000,11EC ;3330           D_0
U 11EC, 0000,003D,4980,3C00,0000,12A7 ;3331   =0      ID[TBER0]_D,CALL,J/CAPAT        ; TB OFF, AND GENERATE SOME TEST PATTERNS
U 11ED, 0F18,0038,1980,0800,0200,1383 ;3332           VA_K[ZERO],D_0          ; INVALIDATE LOCATION 0 IN BOTH GROUPS
U 1383, 0000,003C,0180,9000,0000,11EE ;3333           FS7MCT,MCT/INVALIDATE
```

```
U 11EE, 0000,003D,0180,0800,0000,1296    ;3334    =0        CALL,J/R0S                  ; SET FORCE REPLACE GROUP 0 BIT
U 11EF, 0010,0038,0180,0938,0200,1384    ;3335              VA_RC[7]                    ; VA=04924000
U 1384, 0810,0038,0180,0930,0000,1385    ;3336              D_RC[6]                     ; DATA=66666666
U 1385, 0000,003C,0180,9800,0000,11F0    ;3337              FS/MCT,MCT/VALIDATE         ; WRITE GROUP 0
U 11F0, 0000,003D,0180,0800,0000,129A    ;3338    =0        CALL,J/R1S                  ; SET FORCE REPLACE GROUP 1 BIT
U 11F1, 0010,0038,0180,0928,0200,1386    ;3339              VA_RC[5]                    ; VA=1B6DP000
U 1386, 0810,0038,0180,0920,0000,1387    ;3340              D_RC[4]                     ; DATA=99999999
U 1387, 0000,003C,0180,9800,0000,11F2    ;3341              FS/MCT,MCT/VALIDATE         ; WRITE GROUP 1
U 11F2, 0000,003D,0180,0800,0000,1292    ;3342    =0        CALL,J/SOFF                 ; TURN OFF FORCE REPLACE BITS
U 11F3, 0018,0038,6580,0A80,0000,1388    ;3343              R[0]_K[.10]                 ; INITIALIZE A COUNTER
U 1388, 0000,003C,6180,0800,0084,7389    ;3344              SC_K[.F]                    ; GENERATE AN ADDRESS MASK
U 1389, 0803,0010,0180,0800,0000,138A    ;3345              ALU_MASK+1,D_ALU
U 138A, 0200,003C,0180,0800,0000,138B    ;3346              D_D.RIGHT2,SI/ZERO
U 138B, 0600,003C,0180,0800,0000,138C    ;3347              D_D.RIGHT,SI/ZERO
U 138C, 0001,003C,0180,0A88,0000,11F4    ;3348              R[1]_D                      ; R[1]=1FFFE000
U 11F4, 0000,003D,0180,0800,0000,1246    ;3349    =0        ERLOOP
U 11F5, 0800,003C,0180,0A00,0000,138D    ;3350    ADRG1A:   D_R[0]                      ; GENERATE TEST ADDRESS
U 138D, 0018,0038,85C0,0800,0000,138E    ;3351              Q_K[.C]                     ; A 1 IN 0'S
U 138E, 001D,2014,0180,0A90,0082,138F    ;3352              ALU_Q+D,SC_ALU,R[2]_ALU
U 138F, 0800,0024,0180,0A08,0200,1390    ;3353              ALU_R[1].ANDNOT.MASK,VA_ALU,D_ALU
U 1390, 0001,003C,0180,09F0,0000,11F6    ;3354              RC[0E]_D
U 11F6, 0000,003D,0180,0800,0000,129A    ;3355    =0        CALL,J/R1S                  ; SET FORCE REPLACE GROUP 1 BIT
U 11F7, 0810,0038,0180,0900,0000,1391    ;3356              D_RC[0]                     ; DATA=AAAAAAAA
U 1391, 0000,003C,0180,9800,0000,11F8    ;3357              FS/MCT,MCT/VALIDATE         ; WRITE TEST PATTERN INTO GROUP 1
U 11F8, 0000,003D,0180,0800,0000,1292    ;3358    =0        CALL,J/SOFF                 ; CLEAR FORCE REPLACE BITS
U 11F9, 0000,003C,0180,0800,0000,1392    ;3359              NOP
U 1392, 0010,0038,01C0,0900,0000,10C8    ;3360              Q_RC[0]
U 10C8, 0F01,203D,0180,09D8,0000,111C    ;3361    =00       D_0,CALL,J/RMOH1,RC[0B]_Q ; READ TEST ADDRESS, SHOULD BE A HIT IN GROUP 1
U 10C9, 0000,003D,0180,0800,0000,1247    ;3362              ERROR1                      ; UNEXPECTED UTRAP OCCURRED
U 10CA, 0000,003D,0180,0800,0000,1247    ;3363              ERROR1                      ; HIT/MISS BITS INCORRECT
U 10CB, 001D,2000,0180,0800,0010,1393    ;3364              ALU_Q-D,CLK.UBCC            ; CHECK DATA READ, =AAAAAAAA
U 1393, 0000,013C,0180,0800,0000,11FA    ;3365              Z?
U 11FA, 0000,003D,0180,0800,0000,1247    ;3366    =0        ERROR1                      ; DATA INCORRECT
U 11FB, 0000,003C,0180,0A10,0082,1394    ;3367              SC_R[2]         ; GENERATE TEST ADDRESS PATTERN
U 1394, 0800,0034,0180,0A08,0200,1395    ;3368              ALU_R[1].AND.MASK,VA_ALU,D_ALU ; A 0 IN 1'S
U 1395, 0001,003C,0180,09F0,0000,11FC    ;3369              RC[0E]_D
U 11FC, 0000,003D,0180,0800,0000,129A    ;3370    =0        CALL,J/R1S                  ; SET FORCE REPLACE GROUP 1 BIT
U 11FD, 0810,0038,0180,0910,0000,1396    ;3371              D_RC[2]                     ; DATA=55555555
U 1396, 0000,003C,0180,9800,0000,11FE    ;3372              FS/MCT,MCT/VALIDATE         ; WRITE GROUP 1
U 11FE, 0000,003D,0180,0800,0000,1292    ;3373    =0        CALL,J/SOFF                 ; CLEAR FORCE REPLACE BITS
U 11FF, 0F00,003C,0180,0800,0000,1397    ;3374              D_0
U 1397, 0010,0038,01C0,0910,0000,10CC    ;3375              Q_RC[2]
U 10CC, 0001,203D,0180,09D8,0000,111C    ;3376    =00       CALL,J/RMOH1,RC[0B]_Q       ; READ TEST ADDRESS, SHOULD BE A GROUP 1 HIT
U 10CD, 0000,003D,0180,0800,0000,1247    ;3377              ERROR1                      ; UNEXPECTED UTRAP OCCURRED
U 10CE, 0000,003D,0180,0800,0000,1247    ;3378              ERROR1                      ; HIT/MISS BITS INCORRECT
U 10CF, 001D,2000,0180,0800,0010,1398    ;3379              ALU_Q-D,CLK.UBCC            ; CHECK DATA READ, =55555555
U 1398, 0000,013C,0180,0800,0000,1200    ;3380              Z?
U 1200, 0000,003D,0180,0800,0000,1247    ;3381    =0        ERROR1                      ; DATA INCORRECT
U 1201, 0000,003C,0180,0A00,0010,1399    ;3382              ALU_R[0],CLK.UBCC           ; TRIED ALL TEST PATTERNS?
U 1399, 0000,013C,0180,0800,0000,1202    ;3383              Z?
U 1202, 0018,0000,0580,0A80,0000,11F5    ;3384    =0        R[0]_LA-K[.1],J/ADRG1A      ; IF NOT THEN CONTINUE
U 1203, 0810,0038,0180,0938,0200,139A    ;3385              VA_RC[7],D_RC[7]            ; VA=04924000, SHOULD STILL BE A
U 139A, 0001,003C,0180,09F0,0000,139B    ;3386              RC[0E]_D                    ; HIT IN GROUP 0
U 139B, 0010,0038,01C0,0930,0000,10D0    ;3387              Q_RC[6]
U 10D0, 0001,203D,0180,09D8,0000,111A    ;3388    =00       CALL,J/RHOM1,RC[0B]_Q
```

```
U 10D1, 0000,003D,0180,0800,0000,1247   ;3389          ERROR1                    ; UNEXPECTED UTRAP OCCURRED
U 10D2, 0000,003D,0180,0800,0000,1247   ;3390          ERROR1                    ; HIT/MISS BITS INCORRECT
U 10D3, 001D,2000,0180,0800,0010,139C   ;3391          ALU_Q-D,CLK.UBCC          ; CHECK DATA AT 04924000, =66666666
U 139C, 0000,013C,0180,0800,0000,1204   ;3392          Z?
U 1204, 0000,003D,0180,0800,0000,1247   ;3393   =0     ERROR1                    ; DATA INCORRECT
U 1205, 0000,003C,0180,0800,0000,1206   ;3394          NOP
```

```
                                         ;3395          .PAGE   "TEST D5        GROUP 0 HIT/MISS COMPARATORS TEST"
                                         ;3396    ;*********************************************************************
                                         ;3397    ;++
                                         ;3398    ; TEST  D5      GROUP 0 HIT/MISS COMPARATORS TEST
                                         ;3399    ;
                                         ;3400    ; TEST DESCRIPTION
                                         ;3401    ;       THIS IS A TEST OF THE HIT MISS COMPARATORS OF GROUP ZERO.
                                         ;3402    ;
                                         ;3403    ; LOGIC DESCRIPTION
                                         ;3404    ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                         ;3405    ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                         ;3406    ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                         ;3407    ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                         ;3408    ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                         ;3409    ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                         ;3410    ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                         ;3411    ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                         ;3412    ;       REGISTER ON THE SBI CONTROL MODULE.
                                         ;3413    ;
                                         ;3414    ; ERROR DESCRIPTION
                                         ;3415    ;       ADDRESS WHICH SHOULD BE A HIT
                                         ;3416    ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                         ;3417    ;               ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
                                         ;3418    ;               BITS ARE RELEVANT)
                                         ;3419    ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                         ;3420    ;               UTRAP OCCURS
                                         ;3421    ;       GOT CACHE MAINT REGISTER
                                         ;3422    ;       EXPECTED READ DATA
                                         ;3423    ;       GOT READ DATA
                                         ;3424    ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                         ;3425    ;               FLAG            UTRAP TYPE
                                         ;3426    ;               ----            ----------
                                         ;3427    ;               1DE             NO UTRAP OCCURRED
                                         ;3428    ;               DE              CACHE PARITY UTRAP
                                         ;3429    ;               15E             TB PARITY ERROR
                                         ;3430    ;               19E             TB MISS
                                         ;3431    ;               1CE             TB PROTECTION ERROR
                                         ;3432    ;               1D6             TB MODIFY BIT ERROR
                                         ;3433    ;               1DA             X PAGE UTRAP
                                         ;3434    ;               1DC             UNALIGNED DATA UTRAP
                                         ;3435    ;       ADDRESS REFERENCED
                                         ;3436    ;
                                         ;3437    ;--
                                         ;3438    ;*********************************************************************
                                         ;3439    =0
U 1206, 0000,003D,0180,0800,0000,1233    ;3440    COMGO:  NEWTST
U 1207, 0F18,0038,5D80,09F8,0000,1208    ;3441            D_0,RC[OF]_K[.7]
U 1208, 0000,003D,0180,0800,0000,1250    ;3442    =0      CALL,J/DC.1DE           ; INITIALIZE THE UTRAP FLAG
U 1209, 0001,003C,0180,0AF0,0000,139D    ;3443            R[OE]_D
U 139D, 0F00,003C,0180,0800,0000,120A    ;3444            D_0
U 120A, 0000,003D,4980,3C00,0000,12A7    ;3445    =0      ID[TBERO]_D,CALL,J/CAPAT ; TB OFF, AND GET TEST PATTERNS
U 120B, 0018,0038,1980,0800,0200,139E    ;3446            VA_K[ZERO]              ; INVALIDATE LOCATION 0 IN BOTH GROUPS
U 139E, 0000,003C,0180,9000,0000,120C    ;3447            FS7MCT,MCT/INVALIDATE
U 120C, 0000,003D,0180,0800,0000,1296    ;3448    =0      CALL,J/ROS              ; SET FORCE REPLACE GROUP 0 BIT
U 120D, 0010,0038,0180,0928,0200,139F    ;3449            VA_RC[5]                ; VA=1B6DB000
```

```
U 139F, 0810,0038,0180,0920,0000,13A0   ;3450           D_RC[4]                 ; DATA=99999999
U 13A0, 0000,003C,0180,9800,0000,120E   ;3451           FS/MCT,MCT/VALIDATE     ; WRITE GROUP 0
U 120E, 0000,003D,0180,0800,0000,129A   ;3452   =0      CALL,J/R1S              ; SET FORCE REPLACE GROUP 1 BIT
U 120F, 0010,0038,0180,0938,0200,13A1   ;3453           VA_RC[7]                ; VA=04924000
U 13A1, 0810,0038,0180,0930,0000,13A2   ;3454           D_RC[6]                 ; DATA=66666666
U 13A2, 0000,003C,0180,9800,0000,1210   ;3455           FS/MCT,MCT/VALIDATE     ; WRITE GROUP 1
U 1210, 0000,003D,0180,0800,0000,1292   ;3456   =0      CALL,J/SOFF             ; CLEAR FORCE REPLACE BITS
U 1211, 0018,0038,6580,0A80,0000,13A3   ;3457           R[0]_K[.10]             ; INIATIALIZE A COUNTER
U 13A3, 0000,003C,6180,0800,0084,73A4   ;3458           SC_K[.F]                ; GENERATE A MASK FOR THE ADDRESS TAG.
U 13A4, 0803,0010,0180,0800,0000,13A5   ;3459           ALU_MASK+1,D_ALU
U 13A5, 0200,003C,0180,0800,0000,13A6   ;3460           D_D.RIGHT2,SI/ZERO
U 13A6, 0600,003C,0180,0800,0000,13A7   ;3461           D_D.RIGHT,SI/ZERO
U 13A7, 0001,003C,0180,0A88,0000,1212   ;3462           R[1]_D                  ; R[1]=1FFFE000
U 1212, 0000,003D,0180,0800,0000,1246   ;3463   =0      ERLOOP
U 1213, 0800,003C,0180,0A00,0000,13A8   ;3464   COMGOA: D_R[0]                  ; GENERATE TEST ADDRESS PATTERNS
U 13A8, 0018,0038,85C0,0800,0000,13A9   ;3465           Q_K[.C]                 ; OF 1' IN 0'S, AND 0 IN 1'S.
U 13A9, 001D,2014,0180,0A90,0082,13AA   ;3466           ALU_Q+D,SC_ALU,R[2]_ALU
U 13AA, 0800,0024,0180,0A08,0000,13AB   ;3467           ALU_R[1].ANDNOT.MASK,D_ALU
U 13AB, 0001,003C,0180,0A98,0000,13AC   ;3468           R[3]_D
U 13AC, 0800,0034,0180,0A08,0000,13AD   ;3469           ALU_R[1].AND.MASK,D_ALU
U 13AD, 0001,003C,0180,0AA0,0000,1214   ;3470           R[4]_D
U 1214, 0000,003D,0180,0800,0000,1296   ;3471   =0      CALL,J/R0S              ; SET FORCE REPLACE GROUP 0 BIT
U 1215, 0018,0038,1980,09F0,0200,13AE   ;3472           VA_K[ZERO],RC[0E]_ALU   ; MAKE 0 A HIT IN GROUP 0
U 13AE, 0810,0038,0180,0900,0000,13AF   ;3473           D_RC[0]                 ; DATA=AAAAAAAA
U 13AF, 0000,003C,0180,9800,0000,1216   ;3474           FS/MCT,MCT/VALIDATE     ; WRITE GROUP 0
U 1216, 0000,003D,0180,0800,0000,1292   ;3475   =0      CALL,J/SOFF             ; CLEAR FORCE REPLACE BITS
U 1217, 0800,003C,0180,0A18,0200,13B0   ;3476           VA_R[3],D_R[3]          ; REFERANCE 1 IN 0'S TEST PATTERN
U 13B0, 0001,003C,0180,09C0,0000,10D4   ;3477           RC[8]_D        ; WITH 0 A HIT IN GROUP 0
U 10D4, 0000,003D,0180,0800,0000,111E   ;3478   =00     CALL,J/RMOM1            ; REFERENCE SHOULD BE A MISS
U 10D5, 0000,003D,0180,0800,0000,1247   ;3479           ERROR1                  ; UNEXPECTED UTPAP OCCURRED
U 10D6, 0000,003D,0180,0800,0000,1247   ;3480           ERROR1                  ; HIT/MISS BITS INCORRECT
U 10D7, 0018,0038,1980,09C0,0200,13B1   ;3481           VA_K[ZERO],RC[8]_ALU    ; REFERENCE VA=0
U 13B1, 0010,0038,01C0,0900,0000,10D8   ;3482           Q_RC[0]
U 10D8, 0001,203D,0180,09D8,0000,111A   ;3483   =00     CALL,J/RHOM1,RC[0B]_Q   ; SHOULD BE A HIT
U 10D9, 0000,003D,0180,0800,0000,1247   ;3484           ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 10DA, 0000,003D,0180,0800,0000,1247   ;3485           ERROR1                  ; HIT/MISS BITS INCORRECT
U 10DB, 001D,2000,0180,0800,0010,13B2   ;3486           ALU_Q-D,CLK.UBCC        ; CHECK DATA AT 0, =AAAAAAAA
U 13B2, 0000,013C,0180,0800,0000,1218   ;3487           Z?
U 1218, 0000,003D,0180,0800,0000,1247   ;3488   =0      ERROR1                  ; DATA INCORRECT
U 1219, 0000,003C,0180,0800,0000,121A   ;3489           NOP
U 121A, 0000,003D,0180,0800,0000,1296   ;3490   =0      CALL,J/R0S              ; SET FORCE REPLACE GROUP 0 BIT
U 121B, 0800,003C,0180,0A18,0200,13B3   ;3491           VA_R[3],D_R[3]          ; MAKE 1 IN 0'S PATTERN A HIT IN GROUP 0
U 13B3, 0001,003C,0180,09F0,0000,13B4   ;3492           RC[0E]_D
U 13B4, 0810,0038,0180,0910,0000,13B5   ;3493           D_RC[2]                 ; DATA=55555555
U 13B5, 0000,003C,0180,9800,0000,121C   ;3494           FS/MCT,MCT/VALIDATE     ; WRITE GROUP 0
U 121C, 0000,003D,0180,0800,0000,1292   ;3495   =0      CALL,J/SOFF             ; CLEAR FORCE REPLACE BITS
U 121D, 0018,0038,1980,09C0,0200,10DC   ;3496           VA_K[ZERO],RC[8]_ALU    ; REFERENCE 0, SHOULD BE A MISS
U 10DC, 0000,003D,0180,0800,0000,111E   ;3497   =00     CALL,J/RMOM1            ; WITH 1 IN 0'S PATTERN A HIT
U 10DD, 0000,003D,0180,0800,0000,1247   ;3498           ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 10DE, 0000,003D,0180,0800,0000,1247   ;3499           ERROR1                  ; HIT/MISS BITS INCORRECT
U 10DF, 0800,003C,0180,0A18,0200,13B6   ;3500           VA_R[3],D_R[3]          ; REFERNCE 1 IN 0'S PATTERN
U 13B6, 0001,003C,0180,09C0,0000,13B7   ;3501           RC[08]_D
U 13B7, 0010,0038,01C0,0910,0000,10E0   ;3502           Q_RC[2]
U 10E0, 0001,203D,0180,09D8,0000,111A   ;3503   =00     CALL,J/RHOM1,RC[0B]_Q   ; SHOULD BE A HIT
U 10E1, 0000,003D,0180,0800,0000,1247   ;3504           ERROR1                  ; UNEXPECTED UTRAP OCCURRED
```

```
U 10E2, 0000,003D,0180,0800,0000,1247   ;3505          ERROR1                  ; HIT/MISS BITS INCORRECT
U 10E3, 001D,2000,0180,0800,0010,13B8   ;3506          ALU_Q-D,CLK.UBCC        ; CHECK DATA=55555555
U 13B8, 0000,013C,0180,0800,0000,121E   ;3507          Z?
U 121E, 0000,003D,0180,0800,0000,1247   ;3508   =0     ERROR1                  ; DATA INCORRECT
U 121F, 0000,003C,0180,0800,0000,1220   ;3509          NOP
U 1220, 0000,003D,0180,0800,0000,1296   ;3510   =0     CALL,J/ROS              ; SET FORCE REPLACE GROUP 0 BIT
U 1221, 0800,003C,0180,0A08,0200,13B9   ;3511          VA_R[1],D_R[1]          ; MAKE ADDRESS 1FFFE000 A HIT
U 13B9, 0001,003C,0180,09F0,0000,13BA   ;3512          RC[0E]_D                ; IN GROUP 0
U 13BA, 0810,0038,0180,0900,0000,13BB   ;3513          D_RC[0]                 ; DATA=AAAAAAAA
U 13BB, 0000,003C,0180,9800,0000,1222   ;3514          FS/MCT,MCT/VALIDATE     ; WRITE GROUP 0
U 1222, 0000,003D,0180,0800,0000,1292   ;3515   =0     CALL,J/SOFF             ; CLEAR FORCE REPLACE BITS
U 1223, 0800,003C,0180,0A20,0200,13BC   ;3516          VA_R[4],D_R[4]          ; REFERENCE 0 IN 1'S PATTERN
U 13BC, 0001,003C,0180,09C0,0000,10E4   ;3517          RC[8]_D                 ; WHILE 1FFFE000 IS A HIT
U 10E4, 0000,003D,0180,0800,0000,111E   ;3518   =00    CALL,J/RMOM1            ; 0 IN 1'S SHOULD BE A MISS
U 10E5, 0000,003D,0180,0800,0000,1247   ;3519          ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 10E6, 0000,003D,0180,0800,0000,1247   ;3520          ERROR1                  ; HIT/MISS BITS INCORRECT
U 10E7, 0800,003C,0180,0A08,0200,13BD   ;3521          VA_R[1],D_R[1]          ; REFERNCE ADDRESS 1FFFE000
U 13BD, 0001,003C,0180,09C0,0000,13BE   ;3522          RC[8]_D
U 13BE, 0010,0038,01C0,0900,0000,10E8   ;3523          Q_RC[0]
U 10E8, 0001,203D,0180,09D8,0000,111A   ;3524   =00    CALL,J/RHOM1,RC[0B]_Q   ; SHOUL;D BE A HIT
U 10E9, 0000,003D,0180,0800,0000,1247   ;3525          ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 10EA, 0000,003D,0180,0800,0000,1247   ;3526          ERROR1                  ; HIT/MISS BITS INCORRECT
U 10EB, 001D,2000,0180,0800,0010,13BF   ;3527          ALU_Q-D,CLK.UBCC        ; DATA AT ADDRESS 1FFFE000, =AAAAAAAA
U 13BF, 0000,013C,0180,0800,0000,1224   ;3528          Z?
U 1224, 0000,003D,0180,0800,0000,1247   ;3529   =0     ERROR1                  ; DATA INCORRECT
U 1225, 0000,003C,0180,0800,0000,1226   ;3530          NOP
U 1226, 0000,003D,0180,0800,0000,1296   ;3531   =0     CALL,J/ROS              ; SET FORCE REPLACE GROUP 0 BIT
U 1227, 0800,003C,0180,0A20,0200,13C0   ;3532          VA_R[4],D_R[4]          ; MAKE 0 IN 1'S PATTERN A HIT IN
U 13C0, 0001,003C,0180,09F0,0000,13C1   ;3533          RC[0E]_D                ; GROUP 0
U 13C1, 0810,0038,0180,0910,0000,13C2   ;3534          D_RC[2]                 ; DATA=55555555
U 13C2, 0000,003C,0180,9800,0000,1228   ;3535          FS/MCT,MCT/VALIDATE     ; WRITE GROUP 0
U 1228, 0000,003D,0180,0800,0000,1292   ;3536   =0     CALL,J/SOFF             ; CLEAR FORCE REPLACE BITS
U 1229, 0800,003C,0180,0A08,0200,13C3   ;3537          VA_R[1],D_R[1]          ; REFERENCE ADDRESS 1FFFE000
U 13C3, 0001,003C,0180,09C0,0000,10EC   ;3538          RC[8]_D                 ; WITH 0 IN 1'S PATTERN BEING A HIT
U 10EC, 0000,003D,0180,0800,0000,111E   ;3539   =00    CALL,J/RMOM1            ; 1FFFE000 SHOULD BE A MISS
U 10ED, 0000,003D,0180,0800,0000,1247   ;3540          ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 10EE, 0000,003D,0180,0800,0000,1247   ;3541          ERROR1                  ; HIT/MISS BITS INCORRECT
U 10EF, 0000,003C,0180,0A20,0200,13C4   ;3542          VA_R[4]                 ; REFERENCE 0 IN 1'S PATTERN
U 13C4, 0001,003C,0180,09C0,0000,13C5   ;3543          RC[8]_D
U 13C5, 0010,0038,01C0,0910,0000,10F0   ;3544          Q_RC[2]
U 10F0, 0001,203D,0180,09D8,0000,111A   ;3545   =00    CALL,J/RHOM1,RC[0B]_Q   ; SHOULD BE A HIT
U 10F1, 0000,003D,0180,0800,0000,1247   ;3546          ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 10F2, 0000,003D,0180,0800,0000,1247   ;3547          ERROR1                  ; HIT/MISS BITS INCORRECT
U 10F3, 001D,2000,0180,0800,0010,13C6   ;3548          ALU_Q-D,CLK.UBCC        : DATA=55555555
U 13C6, 0000,013C,0180,0800,0000,122A   ;3549          Z?
U 122A, 0000,003D,0180,0800,0000,1247   ;3550   =0     ERROR1                  ; DATA INCORRECT
U 122B, 0000,003C,0180,0800,0000,13C7   ;3551          NOP
U 13C7, 0000,003C,0180,0A00,0010,13C8   ;3552          ALU_R[0],CLK.UBCC       ; TRIED ALL PATTERNS?
U 13C8, 0000,013C,0180,0800,0000,122C   ;3553          Z?
U 122C, 0018,0000,0580,0A80,0000,1213   ;3554   =0     R[0]_LA-K[.1],J/COMGOA  ; IF NOT CONTINUE
U 122D, 0810,0038,0180,0938,0200,13C9   ;3555          VA_RC[7],D_RC[7]        ; REFERNCE ADDRESS 04924000
U 13C9, 0001,003C,0180,09C0,0000,13CA   ;3556          RC[8]_D
U 13CA, 0001,003C,0180,09F0,0000,13CB   ;3557          RC[0E]_D
U 13CB, 0010,0038,01C0,0930,0000,10F4   ;3558          Q_RC[6]
U 10F4, 0001,203D,0180,09D8,0000,111C   ;3559   =00    CALL,J/RMOH1,RC[0B]_Q   ; SHOULD BE A HIT IN GROUP 1
```

```
U 10F5, 0000,003D,0180,0800,0000,1247   ;3560            ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 10F6, 0000,003D,0180,0800,0000,1247   ;3561            ERROR1                  ; HIT/MISS BITS INCORRECT
U 10F7, 001D,2000,0180,0800,0010,13CC   ;3562            ALU_Q-D,CLK.UBCC        ; DATA=66666666
U 13CC, 0000,013C,0180,0800,0000,122E   ;3563            Z?
U 122E, 0000,003D,0180,0800,0000,1247   ;3564   =0       ERROR1                  ; DATA INCORRECT
U 122F, 0000,003C,0180,0800,0000,1230   ;3565            NOP
                                        ;3566   =0
U 1230, 0000,003D,0180,0800,0000,1233   ;3567   DUMMY1:  NEWTST
```

```
;                             Location / Line Number Index

;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 0000 - 0FFF Unused
U 1000           1871:   1838    1845=   1861=   2293=   2297=   2298=   2301=
U 1008           2327=   2328=   2329=   2330=   2341=   2342=   2343=   2344=
U 1010           2363=   2364=   2365=   2371=   2374=   2375=   2376=   2377=
U 1018           2388=   2390=   2391=   2392=   2411=   2412=   2413=   2419=
U 1020           2422=   2423=   2424=   2425=   2436=   2438=   2439=   2440=
U 1028           2453=   2455=   2456=   1839    2464=   2465=   2466=   2467=
U 1030           2478=   2479=   2480=   2481=   2494=   2495=   2496=   1840
U 1038           2504=   2505=   2506=   2507=   2518=   2519=   2520=   2521=
U 1040           2538=   2539=   2540=   2546=   2549=   2551=   2552=   2553=
U 1048           2570=   2572=   2573=   2574=   1862=   1863=   1902:   1841
U 1050           2589=   2590=   2591=   2597=   2600=   2601=   2602=   2603=
U 1058           1951=   1952=   1905:   1842    1977=   1978=   1908:   1843
U 1060           2620=   2622=   2623=   2624=   2666=   2667=   2668=   2669=
U 1068           2680=   2682=   2683=   2684=   2723=   2725=   2726=   2727=
U 1070           2738=   2739=   2740=   2741=   2812=   2813=   2814=   2815=
U 1078           2817=   2818=   2819=   2820=   2827=   2828=   2829=   2830=
U 1080           2837=   2838=   2839=   2840=   2911=   2912=   2913=   2914=
U 1088           2916=   2917=   2918=   2919=   2926=   2927=   2928=   2929=
U 1090           2936=   2937=   2938=   2939=   3014=   3015=   3016=   1844
U 1098           3018=   3019=   3020=   3021=   3030=   3031=   3032=   1864
U 10A0           3034=   3035=   3036=   3037=   3047=   3048=   3049=   3050=
U 10A8           3125=   3126=   3127=   1865    3129=   3130=   3131=   3132=
U 10B0           3141=   3142=   3143=   1866    3145=   3146=   3147=   3148=
U 10B8           3158=   3159=   3160=   3161=   3245=   3246=   3247=   3248=
U 10C0           3260=   3261=   3262=   3263=   3272=   3273=   3274=   3275=
U 10C8           3361=   3362=   3363=   3364=   3376=   3377=   3378=   3379=
U 10D0           3388=   3389=   3390=   3391=   3478=   3479=   3480=   3481=
U 10D8           3483=   3484=   3485=   3486=   3497=   3498=   3499=   3500=
U 10E0           3503=   3504=   3505=   3506=   3518=   3519=   3520=   3521=
U 10E8           3524=   3525=   3526=   3527=   3539=   3540=   3541=   3542=
U 10F0           3545=   3546=   3547=   3548=   3559=   3560=   3561=   3562=
U 10F8           1980=   1981=   1983=   1984=   1987=   1988=   1990=   1991=
U 1100           1825:   1826:   1827:   1828:   1829:   1830:   1831:   1832:
U 1108           1833:   1867    1993=   1994=   1834:   1835:   1836:   1837:
U 1110           1997=   1998=   2001=   2002=   2007=   2008=   2010=   2011=
U 1118           2020=   2021=   2023=   2024=   2026=   2027=   2029=   2030=
U 1120           2050=   2051=   2059=   2060=   2073=   2074=   2121=   2122=
U 1128           2124=   2125=   2129=   2130=   2132=   2133=   2144=   2145=
U 1130           2146=   2147=   2148=   2149=   2270=   2271=   2272=   2276=
U 1138           2277=   2278=   2280=   2285=   2307=   2308=   2315=   2316=
U 1140           2332=   2338=   2346=   2347=   2353=   2354=   2379=   2385=
U 1148           2394=   2395=   2401=   2402=   2427=   2433=   2442=   2443=
U 1150           2469=   2475=   2483=   2484=   1868    1928:   2509=   2515=
U 1158           2523=   2524=   2531=   2536=   2555=   2556=   2561=   2567=
U 1160           2576=   2577=   2582=   2587=   2605=   2606=   2611=   2617=
U 1168           2626=   2627=   2636=   2637=   2671=   2677=   2686=   2687=
U 1170           2695=   2696=   2729=   2735=   2743=   2744=   2789=   2790=
U 1178           2791=   2792=   2793=   2794=   2795=   2796=   2800=   2801=
U 1180           2804=   2805=   2808=   2809=   2822=   2824=   2832=   2834=
U 1188           2842=   2843=   2888=   2889=   2890=   2891=   2892=   2893=
U 1190           2894=   2895=   2899=   2900=   2903=   2904=   2907=   2908=
U 1198           2921=   2923=   2931=   2933=   2941=   2942=   2990=   2991=
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0           2992=   2993=   2995=   2996=   2998=   2999=   3002=   3003=
U 11A8           3006=   3007=   3008=   3009=   3024=   3025=   3040=   3041=
U 11B0           3043=   3044=   3052=   3053=   3101=   3102=   3103=   3104=
U 11B8           3106=   3107=   3109=   3110=   3113=   3114=   3117=   3118=
U 11C0           3119=   3120=   3135=   3136=   3151=   3152=   3154=   3155=
U 11C8           3163=   3164=   3211=   3212=   3213=   3214=   3216=   3217=
U 11D0           3219=   3220=   3223=   3224=   3227=   3228=   3234=   3235=
U 11D8           3240=   3241=   3243=   3244=   3250=   3251=   3254=   3255=
U 11E0           3257=   3258=   3265=   3266=   3268=   3269=   3277=   3278=
U 11E8           3326=   3327=   3328=   3329=   3331=   3332=   3334=   3335=
U 11F0           3338=   3339=   3342=   3343=   3349=   3350=   3355=   3356=
U 11F8           3358=   3359=   3366=   3367=   3370=   3371=   3373=   3374=
U 1200           3381=   3382=   3384=   3385=   3393=   3394=   3440=   3441=
U 1208           3442=   3443=   3445=   3446=   3448=   3449=   3452=   3453=
U 1210           3456=   3457=   3463=   3464=   3471=   3472=   3475=   3476=
U 1218           3488=   3489=   3490=   3491=   3495=   3496=   3508=   3509=
U 1220           3510=   3511=   3515=   3516=   3529=   3530=   3531=   3532=
U 1228           3536=   3537=   3550=   3551=   3554=   3555=   3564=   3565=
U 1230           3567=   1869    1870    1880    1881    1882    1883    1884
U 1238           1885    1886    1887    1888    1889    1890    1891    1892
U 1240           1893    1894    1895    1896    1897    1898    1899    1900
U 1248           1901    1903    1904    1936    1937    1943    1944    1945
U 1250           1950    1954    1955    1956    1957    1958    1959    1960
U 1258           1961    1962    1963    1964    1965    1966    1967    1968
U 1260           1969    1970    1971    1972    1973    1974    1975    1979
U 1268           1985    1989    1995    1999    2003    2005    2009    2031
U 1270           2032    2033    2034    2035    2036    2037    2038    2039
U 1278           2040    2041    2042    2043    2044    2045    2046    2047
U 1280           2048    2049    2052    2053    2054    2055    2056    2057
U 1288           2058    2061    2062    2066    2067    2068    2069    2070
U 1290           2071    2072    2080    2081    2082    2083    2085    2086
U 1298           2087    2088    2090    2091    2093    2094    2096    2097
U 12A0           2099    2100    2101    2103    2104    2105    2107    2119
U 12A8           2123    2126    1929:   2127    2131    2134    2135    2136
U 12B0           2137    2138    2139    2140    2141    2142    2143    2150
U 12B8           2151    2152    2153    2154    2155    2156    2157    2158
U 12C0           2279    2286    2306    2309    2310    2317    2318    2324
U 12C8           2325    2326    2331    2339    2340    2345    2355    2356
U 12D0           2361    2362    2372    2373    2378    2386    2387    2393
U 12D8           2403    2404    2409    2410    2420    2421    2426    2434
U 12E0           2435    2441    2450    2451    2452    2463    2468    2476
U 12E8           2477    2482    2491    2492    2493    2503    2508    2516
U 12F0           2517    2522    2537    2547    2548    2554    2568    2569
U 12F8           2575    2588    2598    2599    2604    2618    2619    2625
U 1300           2638    2639    2645    2646    2647    2654    2655    2656
U 1308           2663    2664    2665    2670    2678    2679    2685    2697
U 1310           2698    2704    2705    2706    2712    2713    2714    2720
U 1318           2721    2722    2728    2736    2737    2742    2797    2798
U 1320           2799    2802    2803    2806    2807    2810    2811    2816
U 1328           2821    2825    2826    2831    2835    2836    2841    2896
U 1330           2897    2898    2901    2902    2905    2906    2909    2910
U 1338           2915    2920    2924    2925    2930    2934    2935    2940
U 1340           2994    2997    3000    3001    3004    3005    3011    3012
```

```
;Location          0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348            3013    3022    3023    3027    3028    3029    3038    3039
U 1350            3042    3045    3046    3051    3105    3108    3111    3112
U 1358            3115    3116    3122    3123    3124    3133    3134    3138
U 1360            3139    3140    3149    3150    3153    3156    3157    3162
U 1368            3215    3218    3221    3222    3225    3226    3229    3230
U 1370            3231    3232    3233    3236    3237    3238    3239    3242
U 1378            3249    3252    3253    3256    3259    3264    3267    3270
U 1380            3271    3276    3330    3333    3336    3337    3340    3341
U 1388            3344    3345    3346    3347    3348    3351    3352    3353
U 1390            3354    3357    3360    3365    3368    3369    3372    3375
U 1398            3380    3383    3386    3387    3392    3444    3447    3450
U 13A0            3451    3454    3455    3458    3459    3460    3461    3462
U 13A8            3465    3466    3467    3468    3469    3470    3473    3474
U 13B0            3477    3482    3487    3492    3493    3494    3501    3502
U 13B8            3507    3512    3513    3514    3517    3522    3523    3528
U 13C0            3533    3534    3535    3538    3543    3544    3549    3552
U 13C8            3553    3556    3557    3558    3563
U 13D0 - 13EF Unused
U 13F0            1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8            1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH2D        989

Used             989
Remaining

Total microwords used in memory U: 989
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH2D.MIC

Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 1806  MICRO TRAP HANDLER AND LSI-MONITER CALL ROUT[illegible]NES
; 2174  TEST D6 GROUP 1 HIT/MISS COMPARATORS TEST
; 2346  TEST D7 ADDRESS PARITY LOGIC TEST
; 2513  TEST D8 DATA PARITY LOGIC TEST
; 2685  TEST D9 FORCE MISS BIT AND PARITY ERROR TEST [illegible] GROUP 0
; 2773  TEST DA FORCE MISS BIT AND PARITY ERROR TEST IN GROUP 1
; 2862  TEST DB PA<29> AFFECT ON HIT/MISS COMPARATORS TEST
; 2960  TEST DC STATIC TEST OF GROUP 0'S AND GROUP 1'S DATA MEMORY
; 3094  TEST DD STATIC TEST OF GROUP 0'S ADDRESS MEMORY
; 3210  TEST DE STATIC TEST OF GROUP 1'S ADDRESS MEMORY
```

```
;1      .NOLIST
;1804   .LIST
;1805
```

```
                                             .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                         .REGION/1000,13FF
                                         ;+
                                         ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                         ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                         ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                         ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                         ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                         ;
                                         ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                         ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                         ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                         ;       R[OF] AND DO A RETURN0.
                                         ;
                                         ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                         ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                         ; TO THE CONSOLE.
                                         ;
                                         ;-
U 1100, 0000,003C,1980,0800,0084,7003    1100:   SC_K[ZERO],J/TRPH1      ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001    1101:   SC_K[.1],J/TRPH0        ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001    1102:   SC_K[.2],J/TRPH0        ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001    1103:   SC_K[.3],J/TRPH0        ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001    1104:   SC_K[.4],J/TRPH0        ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001    1105:   SC_K[.6],J/TRPH0        ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001    1106:   SC_K[.9],J/TRPH0        ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001    1107:   SC_K[.7],J/TRPH0        ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001    1108:   SC_K[.8],J/TRPH0        ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003    110C:   SC_K[.C],J/TRPH1        ; RDS
U 110D, 0000,003C,8980,0800,0084,7003    110D:   SC_K[.D],J/TRPH1        ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001    110E:   SC_K[.10],J/TRPH0       ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003    110F:   SC_K[.F],J/TRPH1        ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,104F    TRPH0:  Q_ID[USTACK]
U 104F, 0C00,003C,01E0,0800,0000,105B            Q_D,D_Q
U 105B, 0000,003C,8180,3C00,0000,105F            ID[USTACK]_D
U 105F, 0C00,003C,01E0,0800,0000,1109            Q_D,D_Q
U 1109, 0000,003C,01C0,0A78,0000,1154            Q_R[OF]
U 1154, 0001,2024,0180,0800,0010,11B0            ALU_Q.ANDNOT.MASK,CLK.UBCC       ; WAS TRAP EXPECTED?
U 11B0, 0000,013C,0180,0800,0000,1002            Z?                               ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000    =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
                                         ;+
                                         ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                         ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                         ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                         ;
                                         ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                         ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                         ;             FAULT STATUS REGISTER
                                         ;             SBI ERROR REGISTER
                                         ;             TIMEOUT ADDRESS REGISTER
                                         ;             MAINTENANCE REGISTER
                                         ;             CACHE PARITY REGISTER
                                         ;             TB ERROR REGISTER 1
                                         ;             TB ERROR REGISTER 0
                                         ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,104C   ;1861   TRPH1:  RC[0D]_SC
U 104C, 0000,003D,D980,0800,0084,71D2   ;1862   =0      SETRCF[.9]
U 104D, 0000,003C,49F0,2C00,0000,11B1   ;1863           Q_ID[TBER0]
U 11B1, 0001,203C,4DF0,2DB0,0000,11B2   ;1864           RC[6]_Q,Q_ID[TBER1]
U 11B2, 0001,203C,65F0,2DB8,0000,11B3   ;1865           RC[7]_Q,Q_ID[SBI.ERR]
U 11B3, 0001,203C,6DF0,2DD8,0000,11B4   ;1866           RC[0B]_Q,Q_ID[FAULT]
U 11B4, 0001,203C,75F0,2DE0,0000,11B5   ;1867           RC[0C]_Q,Q_ID[MAINT]
U 11B5, 0001,203C,79F0,2DC8,0000,11B6   ;1868           RC[9]_Q,Q_ID[PARITY]
U 11B6, 0001,203C,69F0,2DC0,0000,11B7   ;1869           RC[8]_Q,Q_ID[TIME.ADDR]
U 11B7, 0001,203C,81F0,2DD0,0000,1000   ;1870           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,11CC   ;1871   1000:   RC[0E]_Q,ERROR1
                                        ;1872   ;+
                                        ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1875   ;                NEWTST
                                        ;1876   ;                ERLOOP
                                        ;1877   ;                ERROR1
                                        ;1878   ;                ERROR2
                                        ;1879   ;
U 11B8, 0000,003C,65F8,0800,0084,71B9   ;1880   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 11B9, 0818,0038,8D80,0800,0000,11BA   ;1881           D_K[.1F]                        ; ...
U 11BA, 0D00,003C,0180,0800,0000,11BB   ;1882           D_DAL.SC
U 11BB, 0000,003C,3D80,3C00,0000,11BC   ;1883           ID[PSL]_D                       ; WRITE THE PSL
U 11BC, 0818,0038,0580,0800,0000,11BD   ;1884           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 11BD, 0D00,003C,0180,0800,0000,11BE   ;1885           D_DAL.SC
U 11BE, 0F00,003C,3180,3C00,0000,11BF   ;1886           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 11BF, 0000,003C,5D80,3C00,0000,11C0   ;1887           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 11C0, 0000,003C,3980,3C00,0000,11C1   ;1888           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 11C1, 0000,003C,2980,3C00,0000,11C2   ;1889           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 11C2, 0000,003C,4980,3C00,0000,11C3   ;1890           ID[TBER0]_D                     ; SHUT OFF THE TB
U 11C3, 0818,0038,C180,0800,0000,11C4   ;1891           D_K[.FFFF]
U 11C4, 0000,003C,6580,3C00,0000,11C5   ;1892           ID[SBI.ERR]_D
U 11C5, 0F00,003C,6D80,3C00,0000,11C6   ;1893           ID[FAULT]_D,D_0
U 11C6, 0000,003C,6D80,3C00,0000,11C7   ;1894           ID[FAULT]_D
U 11C7, 0000,003C,6580,3C00,0000,11C8   ;1895           ID[SBI.ERR]_D
U 11C8, 0003,003C,0180,09F0,0000,11C9   ;1896           RC[0E]_0
U 11C9, 0003,003C,0180,0AF8,0000,11CA   ;1897           R[0F]_0
U 11CA, 0003,003C,0180,09E8,0000,105E   ;1898           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 11CB, 0818,0038,0980,0800,0000,105E   ;1899   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 11CC, 0810,0038,0180,0978,0000,11CD   ;1900   ERROR1: D_RC[0F]
U 11CD, 0819,0034,4D80,0800,0000,104E   ;1901           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1902   104E:   D_D.OR.K[.4],J/CALLCON
U 11CE, 0810,0038,0180,0978,0000,11CF   ;1903   ERROR2: D_RC[0F]
U 11CF, 0819,0034,4D80,0800,0000,105A   ;1904           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1905   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1906   105E:
                                        ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1908           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1909   ;+
                                        ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1912   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1913   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1914   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1915   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,11D0   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 11D0, 0810,0038,4D80,0978,0000,11D1   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 11D1, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 11D2, 0010,0038,01C0,0978,0000,11D3   ;1943   SETRCF: Q_RC[OF]
U 11D3, 0019,2034,4DC0,0800,0000,11D4   ;1944           Q_Q.AND.K[.FF00]
U 11D4, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946
                                        ;1947   ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                        ;1948   ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                        ;1949   ; CERTAIN TRAPS.
U 11D5, 0018,0038,C180,0800,0000,11D6   ;1950   DC.1DE: ALU_K[.FFFF]
U 11D6, 0500,003C,0380,0800,0000,1058   ;1951           D_D.LEFT,SI/7
U 1058, 0000,003D,0180,0800,0000,11E8   ;1952   =0      CALL,J/DCD
U 1059, 0000,003C,0180,0800,0000,105C   ;1953           NOP
U 105C, 0000,003D,0180,0800,0000,11E9   ;1954   =0      CALL,J/DCE
U 105D, 0000,003E,0180,0800,0000,0001   ;1955           RETURN1
                                        ;1956   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 11D7, 0118,0038,1B80,0800,0000,11EB   ;1957   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 11D8, 0118,0038,0B80,0800,0000,11EB   ;1958   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 11D9, 0118,0038,0780,0800,0000,11EB   ;1959   S10:    ALU_K[.1],D_D.LEFT2,SI/7.J/SX
U 11DA, 0118,0038,C380,0800,0000,11EB   ;1960   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 11DB, 0018,0038,1980,0800,0000,11D7   ;1961   DC0:    ALU_0(K),J/S00
U 11DC, 0018,0038,1980,0800,0000,11D8   ;1962   DC1:    ALU_0(K),J/S01
U 11DD, 0018,0038,1980,0800,0000,11D9   ;1963   DC2:    ALU_0(K),J/S10
U 11DE, 0018,0038,1980,0800,0000,11DA   ;1964   DC3:    ALU_0(K),J/S11
U 11DF, 0018,0038,0980,0800,0000,11D7   ;1965   DC4:    ALU_K[.2],J/S00
U 11E0, 0018,0038,0980,0800,0000,11D8   ;1966   DC5:    ALU_K[.2],J/S01
U 11E1, 0018,0038,0980,0800,0000,11D9   ;1967   DC6:    ALU_K[.2],J/S10
U 11E2, 0018,0038,0980,0800,0000,11DA   ;1968   DC7:    ALU_K[.2],J/S11
U 11E3, 0018,0038,0580,0800,0000,11D7   ;1969   DC8:    ALU_K[.1],J/S00
U 11E4, 0018,0038,0580,0800,0000,11D8   ;1970   DC9:    ALU_K[.1],J/S01
```

```
U 11E5, 0018,0038,0580,0800,0000,11D9   ;1971   DCA:    ALU_K[.1],J/S10
U 11E6, 0018,0038,0580,0800,0000,11DA   ;1972   DCB:    ALU_K[.1],J/S11
U 11E7, 0018,0038,C180,0800,0000,11D7   ;1973   DCC:    ALU_K[.FFFF],J/S00
U 11E8, 0018,0038,C180,0800,0000,11D8   ;1974   DCD:    ALU_K[.FFFF],J/S01
U 11E9, 0018,0038,C180,0800,0000,11D9   ;1975   DCE:    ALU_K[.FFFF],J/S10
U 11EA, 0018,0038,C180,0800,0000,11DA   ;1976   DCF:    ALU_K[.FFFF],J/S11
U 11EB, 0100,003E,0380,0800,0000,0001   ;1977   SX:     D_D.LEFT2,SI/7,RETURN1
U 11EC, 0018,0038,01C0,0800,0000,106C   ;1978   DC.5:   Q_K[.8]
                                        ;1979   =0
U 106C, 0000,003D,0180,0800,0000,11E0   ;1980   DC.5A:  CALL,J/DC5
U 106D, 0019,2000,05C0,0800,0010,11ED   ;1981           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 11ED, 0000,013C,0180,0800,0000,106E   ;1982           Z?
U 106E, 0000,003C,0180,0800,0000,106C   ;1983   =0      J/DC.5A
U 106F, 0000,003E,0180,0800,0000,0001   ;1984           RETURN1
                                        ;1985   =0
U 1070, 0000,003D,0180,0800,0000,11EC   ;1986   DC.A:   CALL,J/DC.5
U 1071, 0500,003E,0180,0800,0000,0001   ;1987           D_D.LEFT,SI/ZERO,RETURN1
U 11EE, 0018,0038,01C0,0800,0000,1072   ;1988   DC.9:   Q_K[.8]
                                        ;1989   =0
U 1072, 0000,003D,0180,0800,0000,11E4   ;1990   DC.9A:  CALL,J/DC9
U 1073, 0019,2000,05C0,0800,0010,11EF   ;1991           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 11EF, 0000,013C,0180,0800,0000,1074   ;1992           Z?
U 1074, 0000,003C,0180,0800,0000,1072   ;1993   =0      J/DC.9A
U 1075, 0000,003E,0180,0800,0000,0001   ;1994           RETURN1
                                        ;1995   =0
U 1076, 0000,003D,0180,0800,0000,11EE   ;1996   DC.C:   CALL,J/DC.9
U 1077, 0018,0038,C180,0800,0000,11F0   ;1997           ALU_K[.FFFF]
U 11F0, 0600,003E,0380,0800,0000,0001   ;1998           D_D.RIGHT,SI/7,RETURN1
                                        ;1999   =0
U 1078, 0000,003D,0180,0800,0000,11EE   ;2000   DC.6:   CALL,J/DC.9
U 1079, 0018,0038,0580,0800,0000,11F1   ;2001           ALU_K[.1]
U 11F1, 0100,003E,0380,0800,0000,0001   ;2002           D_D.LEFT2,SI/7,RETURN1
                                        ;2003   =0
U 107A, 0000,003D,0180,0800,0000,11EE   ;2004   DC.3:   CALL,J/DC.9
U 107B, 0018,0038,C180,0800,0000,11F2   ;2005           ALU_K[.FFFF]
U 11F2, 0500,003E,0380,0800,0000,0001   ;2006           D_D.LEFT,SI/7,RETURN1
                                        ;2007   ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
                                        ;2008   ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
                                        ;2009   ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 11F3, 0000,003F,0180,0800,0000,117C   ;2010   TARGC3: SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001   ;2011   117C:   RETURN1
U 117D, 0000,003E,0180,0800,0000,0002   ;2012   117D:   RETURN2
U 117E, 0000,003E,0180,0800,0000,0003   ;2013   117E:   RETURN3
U 117F, 0000,003E,0180,0800,0000,0004   ;2014   117F:   RETURN4
U 11FC, 0000,003D,0180,0800,0000,11CC   ;2015   11FC:   ERROR1
U 11FD, 0000,003D,0180,0800,0000,11CC   ;2016   11FD:   ERROR1
U 11FE, 0000,003D,0180,0800,0000,11CC   ;2017   11FE:   ERROR1
U 11FF, 0000,003D,0180,0800,0000,11CC   ;2018   11FF:   ERROR1
                                        ;2019   ; THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAA IN THE D REGISTER.
U 11F4, 0F18,0038,5DC0,0800,0000,107C   ;2020   DCLA:   D_0,Q_K[.7]
                                        ;2021   =0
U 107C, 0000,003D,0180,0800,0000,11E5   ;2022   DCLA1:  CALL,J/DCA
U 107D, 0001,203C,0180,0800,0010,11F5   ;2023           ALU_Q,CLK.UBCC
U 11F5, 0000,013C,0180,0800,0000,107E   ;2024           Z?
U 107E, 0019,2000,05C0,0800,0000,107C   ;2025   =0      Q_Q-K[.1],J/DCLA1
```

```
U 107F, 0000,003E,0180,0800,0000,0001   ;2026           RETURN1
                                        ;2027   ; THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
                                        ;2028   ; THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
                                        ;2029   ; IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED, IF NO
                                        ;2030   ; UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
                                        ;2031   ; IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
                                        ;2032   ; TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
                                        ;2033   ; WILL CONTAIN THE READ DATA.
                                        ;2034   =0
U 1080, 0F00,003D,0180,0800,0000,11E1   ;2035   RHOH1:  D_0,CALL,J/DC6
U 1081, 0000,003C,0180,0800,0000,1087   ;2036           J7READ
                                        ;2037   =0
U 1082, 0F00,003D,0180,0800,0000,11DD   ;2038   RHOM1:  D_0,CALL,J/DC2
U 1083, 0000,003C,0180,0800,0000,1087   ;2039           J7READ
                                        ;2040   =0
U 1084, 0F00,003D,0180,0800,0000,11DF   ;2041   RMOH1:  D_0,CALL,J/DC4
U 1085, 0000,003C,0180,0800,0000,1087   ;2042           J7READ
                                        ;2043   =0
U 1086, 0F00,003C,0180,0800,0000,1087   ;2044   RMOM1:  D_0,J/READ
U 1087, 0000,003C,01F8,0800,0084,71F6   ;2045   READ:   SC_K[.8],Q_0             ; CALCULATE THE EXPECTED HIT/MISS BITS
U 11F6, 0D00,003C,0180,0800,0000,11F7   ;2046           D_DAL.SC
U 11F7, 0001,003C,0180,09E8,0000,11F8   ;2047           RC[0D]_D
U 11F8, 0818,0038,6180,0800,0084,71F9   ;2048           D_K[.F],SC_K[.F]         ; CALCULATE THE EXPECTED FORCE MISS
U 11F9, 0000,003C,09F8,0800,0084,B1FA   ;2049           SC_SC-K[.2],Q_0          ;  AND FORCE REPLACE BITS
U 11FA, 0D00,003C,75F0,2C00,0000,11FB   ;2050           D_DAL.SC,Q_ID[MAINT]
U 11FB, 001D,0034,01C0,0800,0000,1200   ;2051           A[U_D[AND]Q,Q_ALU
U 1200, 0810,0038,0180,0968,0000,1201   ;2052           D_RC[0D]
U 1201, 001D,0030,0180,09E8,0000,1202   ;2053           A[U_D[OR]Q,RC[0D]_ALU
U 1202, 0000,003C,0180,0A70,0000,1203   ;2054           LAB_R[0E]
U 1203, 0000,003C,0180,52F8,0000,1204   ;2055           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK
U 1204, 0001,003C,0180,09D0,0000,1205   ;2056           RC[0A]_D
U 1205, 0000,003C,75F0,2C00,0000,1206   ;2057           Q_ID[MAINT]
U 1206, 0800,003C,0180,0A78,0000,1207   ;2058           D_R[0F]
U 1207, 0003,003C,0180,0AF8,0000,1208   ;2059           R[0F]_0
U 1208, 0001,203C,0180,09E0,0000,1209   ;2060           RC[0C]_Q
U 1209, 0000,003C,01C0,0A70,0000,120A   ;2061           Q_R[0E]
U 120A, 0001,003C,0180,09C8,0000,120B   ;2062           RC[9]_D
U 120B, 001D,2000,0180,0800,0010,120C   ;2063           ALU_Q-D,CLK.UBCC
U 120C, 0000,013C,0180,0800,0000,1088   ;2064           Z?
U 1088, 0000,003C,0180,0800,0000,1214   ;2065   =0      J/RERR
U 1089, 0818,0038,D5F8,0800,0000,120D   ;2066           Q_0,D_K[.6]
U 120D, 0000,003C,0180,0800,0084,720E   ;2067           SC_K[.8]
U 120E, 0D10,0038,01C0,0960,0000,120F   ;2068           D_DAL.SC,Q_RC[0C]
U 120F, 001D,2034,01C0,0800,0000,1210   ;2069           A[U_Q[AND]D,Q_ALU
U 1210, 0810,0038,0180,0968,0000,1211   ;2070           D_RC[0D]
U 1211, 0819,0034,9180,0800,0000,1212   ;2071           A[U_D[AND]K[.1F00],D_ALU ; AND OUT EVERYTHING BUT HIT/MISS BITS
U 1212, 001D,2000,0180,0800,0010,1213   ;2072           ALU_Q-D,CLK.UBCC
U 1213, 0010,0138,01C0,0958,0000,108A   ;2073           Z?,Q_RC[0B]
U 108A, 0000,003E,0180,0800,0000,0002   ;2074   =0      RETURN2
U 108B, 0810,003A,0180,0950,0000,0003   ;2075           D_RC[0A],RETURN3
U 1214, 0000,003C,79F0,2C00,0000,1215   ;2076   RERR:   Q_ID[PARITY]
U 1215, 0001,203E,0180,09E8,0000,0001   ;2077           RC[0D]_Q,RETURN1
                                        ;2078   ; THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
                                        ;2079   ; AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
                                        ;2080   ; ELSE RETURN2.
```

```
U 1216, 0000,003C,0180,0A70,0000,1217   ;2081   WRITE:  LAB_R[0E]
U 1217, 0000,003C,0180,32F8,0000,1218   ;2082           R[0F]_LA,FS/MCT,MCT/WRITE.V.WCHK
U 1218, 0800,003C,0180,0A78,0000,1219   ;2083           D_R[0F]
U 1219, 0003,003C,0180,0AF8,0000,121A   ;2084           R[0F]_0
U 121A, 0000,003C,01C0,0A70,0000,121B   ;2085           Q_R[0E]
U 121B, 001D,2000,0180,0800,0010,121C   ;2086           ALU_Q-D,CLK.UBCC
U 121C, 0000,013C,0180,0800,0000,108C   ;2087           Z?
U 108C, 0000,003C,0180,0800,0000,1214   ;2088   =0      J/RERR                  ; UTRAPPED.
U 108D, 0000,003E,0180,0800,0000,0002   ;2089           RETURN2                 ; OK NO UTRAP.
                                        ;2090   ; THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
                                        ;2091   ; REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
                                        ;2092   ; CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
                                        ;2093   ; NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
                                        ;2094   ; DISSABLE SBI CYCLES:
U 121D, 0F00,003C,0180,0800,0000,121E   ;2095   SOFF:   D_0
U 121E, 0000,003C,8580,0800,0084,721F   ;2096   S1:     SC_K[.C]
U 121F, 0801,001C,0180,0800,0000,1220   ;2097           ALU_D.ORNOT.MASK,D_ALU
U 1220, 0000,003E,7580,3C00,0000,0001   ;2098           ID[MAINT]_D,RETURN1
                                        ;2099   ; SET FORCE REPLACE GROUP ZERO BIT
U 1221, 0F00,003C,0180,0800,0000,1222   ;2100   R0S:    D_0
U 1222, 0000,003C,6180,0800,0084,7223   ;2101   S2:     SC_K[.F]
U 1223, 0000,003C,0580,0800,0084,B224   ;2102           SC_SC-K[.1]
U 1224, 0801,001C,0180,0800,0000,121E   ;2103   S3:     ALU_D.ORNOT.MASK,D_ALU,J/S1
                                        ;2104   ; SET FORCE REPLACE GROUP 1 BIT
U 1225, 0F00,003C,0180,0800,0000,1226   ;2105   R1S:    D_0
U 1226, 0000,003C,8980,0800,0084,7224   ;2106   S4:     SC_K[.D],J/S3
                                        ;2107   ; SET FORCE MISS GROUP 0 BIT
U 1227, 0F00,003C,0180,0800,0000,1228   ;2108   M0S:    D_0
U 1228, 0000,003C,6580,0800,0084,7224   ;2109   S5:     SC_K[.10],J/S3
                                        ;2110   ; SET FORCE MISS GROUP 1 BIT
U 1229, 0F00,003C,0180,0800,0000,122A   ;2111   M1S:    D_0
U 122A, 0000,003C,6180,0800,0084,7224   ;2112   S6:     SC_K[.F],J/S3
                                        ;2113   ; SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
U 122B, 0F00,003C,0180,0800,0000,122C   ;2114   M10S:   D_0
U 122C, 0000,003C,6180,0800,0084,722D   ;2115           SC_K[.F]
U 122D, 0801,001C,0180,0800,0000,1228   ;2116   S7:     ALU_D.ORNOT.MASK,D_ALU,J/S5
                                        ;2117   ; SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
U 122E, 0F00,003C,0180,0800,0000,122F   ;2118   R0M1S:  D_0
U 122F, 0000,003C,6180,0800,0084,7230   ;2119           SC_K[.F]
U 1230, 0801,001C,0180,0800,0000,1222   ;2120           ALU_D.ORNOT.MASK,D_ALU,J/S2
                                        ;2121   ; SET FORCE REPLACE GROUP 1 FORCE MISS GROUP 0 BITS
U 1231, 0F00,003C,8980,0800,0084,722D   ;2122   R1M0S:  D_0,SC_K[.D],J/S7
                                        ;2123   ; THIS SUBROUTINE IS CALLED TO GENERATE SOME BASIC DATA AND ADDRESS
                                        ;2124   ; PATTERNS WHICH ARE USED BY MANY OF THE CACHE TESTS. IT LEAVES
                                        ;2125   ; THESE PATTERNS IN THE RC SCRATCH PADS.
                                        ;2126   ;       RC[0]           AAAAAAAA
                                        ;2127   ;       RC[1]           19999000
                                        ;2128   ;       RC[2]           55555555
                                        ;2129   ;       RC[3]           06666000
                                        ;2130   ;       RC[4]           99999999
                                        ;2131   ;       RC[5]           1B6DB000
                                        ;2132   ;       RC[6]           66666666
                                        ;2133   ;       RC[7]           04924000
U 1232, 0F18,0038,5DC0,0800,0000,108E   ;2134   CAPAT:  Q_K[.7],D_0
                                        ;2135   =0
```

```
U 108E, 0000,003D,0180,0800,0000,11E5   ;2136   CAP1:   CALL,J/DCA
U 108F, 0001,203C,0180,0800,0010,1233   ;2137           ALU_Q,CLK.UBCC
U 1233, 0000,013C,0180,0800,0000,1090   ;2138           Z?
U 1090, 0019,2000,05C0,0800,0000,108E   ;2139   =0      Q_Q-K[.1],J/CAP1
U 1091, 0001,003C,0180,0980,0000,1234   ;2140           RC[0]_D
U 1234, 0001,0028,0180,0990,0000,1235   ;2141           ALU_NOT.D,RC[2]_ALU
U 1235, 0F18,0038,5DC0,0800,0000,1092   ;2142           Q_K[.7],D_0
                                        ;2143   =0
U 1092, 0000,003D,0180,0800,0000,11E4   ;2144   CAP2:   CALL,J/DC9
U 1093, 0001,203C,0180,0800,0010,1236   ;2145           ALU_Q,CLK.UBCC
U 1236, 0000,013C,0180,0800,0000,1094   ;2146           Z?
U 1094, 0019,2000,05C0,0800,0000,1092   ;2147   =0      Q_Q-K[.1],J/CAP2
U 1095, 0001,003C,0180,09A0,0000,1237   ;2148           RC[4]_D
U 1237, 0001,0028,0180,09B0,0000,1238   ;2149           ALU_NOT.D,RC[6]_ALU
U 1238, 0000,003C,89F8,0800,0084,7239   ;2150           Q_0,SC_K[.D]
U 1239, 0D00,003C,0180,0800,0000,123A   ;2151           D_DAL.SC
U 123A, 0600,003C,0180,0800,0000,123B   ;2152           D_D.RIGHT,SI/ZERO
U 123B, 0001,003C,0180,0988,0000,123C   ;2153           RC[1]_D
U 123C, 0810,0038,65F8,0930,0084,723D   ;2154           D_RC[6],SC_K[.10],Q_0
U 123D, 0D00,003C,0180,0800,0000,123E   ;2155           D_DAL.SC
U 123E, 0200,003C,0180,0800,0000,123F   ;2156           D_D.RIGHT2,SI/ZERO
U 123F, 0200,003C,0180,0800,0000,1240   ;2157           D_D.RIGHT2,SI/ZERO
U 1240, 0F01,003C,0180,0998,0000,1096   ;2158           RC[3]_D,D_0
U 1096, 0000,003D,0180,0800,0000,11E4   ;2159   =0      CALL,J/DC9
U 1097, 0100,003C,0180,0800,0000,1098   ;2160           D_D.LEFT2,SI/ZERO
U 1098, 0000,003D,0180,0800,0000,11E4   ;2161   =0      CALL,J/DC9
U 1099, 0500,003C,0180,0800,0000,109A   ;2162           D_D.LEFT,SI/ZERO
U 109A, 0000,003D,0180,0800,0000,11DF   ;2163   =0      CALL,J/DC4
U 109B, 0001,0028,0180,09A8,0000,1241   ;2164           ALU_NOT.D,RC[5]_ALU
U 1241, 0000,003C,85F8,0800,0084,7242   ;2165           SC_K[.C],Q_0
U 1242, 0D00,003C,0180,0800,0000,1243   ;2166           D_DAL.SC
U 1243, 0001,003C,0180,09B8,0000,1244   ;2167           RC[7]_D
U 1244, 0810,0038,0180,0928,0000,1245   ;2168           D_RC[5]
U 1245, 0000,003C,61F8,0800,0084,7246   ;2169           SC_K[.F],Q_0
U 1246, 0D00,003C,0180,0800,0000,1247   ;2170           D_DAL.SC
U 1247, 0200,003C,0180,0800,0000,1248   ;2171           D_D.RIGHT2,SI/ZERO
U 1248, 0600,003C,0180,0800,0000,1249   ;2172           D_D.RIGHT,SI/ZERO
U 1249, 0001,003E,0180,09A8,0000,0001   ;2173           RC[5]_D,RETURN1
```

```
                                     ;2174          .PAGE   "TEST D6        GROUP 1 HIT/MISS COMPARATORS TEST"
                                     ;2175   ;***************************************************************
                                     ;2176   ;++
                                     ;2177   ; TEST  D6      GROUP 1 HIT MISS COMPARATORS TEST
                                     ;2178   ;
                                     ;2179   ; TEST DESCRIPTION
                                     ;2180   ;       THIS IS A TEST OF THE HIT MISS COMPARATORS OF GROUP ONE.
                                     ;2181   ;
                                     ;2182   ; LOGIC DESCRIPTION
                                     ;2183   ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                     ;2184   ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                     ;2185   ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                     ;2186   ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                     ;2187   ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                     ;2188   ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                     ;2189   ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                     ;2190   ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                     ;2191   ;       REGISTER ON THE SBI CONTROL MODULE.
                                     ;2192   ;
                                     ;2193   ; ERROR DESCRIPTION
                                     ;2194   ;       ADDRESS WHICH SHOULD BE A HIT IN GROUP 1
                                     ;2195   ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                     ;2196   ;               ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE BITS
                                     ;2197   ;               ARE RELEVANT)
                                     ;2198   ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                     ;2199   ;               UTRAP OCCURS
                                     ;2200   ;       GOT CACHE MAINT REGISTER
                                     ;2201   ;       EXPECTED READ DATA
                                     ;2202   ;       GOT READ DATA
                                     ;2203   ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                     ;2204   ;               FLAG            UTRAP TYPE
                                     ;2205   ;               ----            ----------
                                     ;2206   ;               1DE             NO UTRAP OCCURRED
                                     ;2207   ;               DE              CACHE PARITY UTRAP
                                     ;2208   ;               15E             TB PARITY ERROR
                                     ;2209   ;               19E             TB MISS
                                     ;2210   ;               1CE             TB PROTECTION ERROR
                                     ;2211   ;               1D6             TB MODIFY BIT ERROR
                                     ;2212   ;               1DA             X PAGE UTRAP
                                     ;2213   ;               1DC             UNALIGNED DATA UTRAP
                                     ;2214   ;       ADDRESS REFERENCED
                                     ;2215   ;
                                     ;2216   ;--
                                     ;2217   ;***************************************************************
                                     ;2218   =0
U 109C, 0000,003D,0180,0800,0000,11B8 ;2219   COMG1:  NEWTST
U 109D, 0F18,0038,5D80,09F8,0000,109E ;2220           D_0,RC[0F]_K[.7]
U 109E, 0000,003D,0180,0800,0000,11D5 ;2221   =0      CALL,J/DC.1DE           ; GENERATE UTRAP FLAG
U 109F, 0001,003C,0180,0AF0,0000,124A ;2222           R[0E]_D
U 124A, 0F00,003C,0180,0800,0000,10A0 ;2223           D_0
U 10A0, 0000,003D,4980,3C00,0000,1232 ;2224   =0      ID[TBER0]_D,CALL,J/CAPAT ; TB OFF, AND GET TEST PATTERNS
U 10A1, 0018,0038,1980,0800,0200,124B ;2225           VA_K[ZERO]              ; INVALIDATE LOCATION 0
U 124B, 0000,003C,0180,9000,0000,10A2 ;2226           FS7MCT,MCT/INVALIDATE   ; OF BOTH GROUPS
U 10A2, 0000,003D,0180,0800,0000,1221 ;2227   =0      CALL,J/ROS              ; SET FORCE REPLACE GROUP 0 BIT
U 10A3, 0010,0038,0180,0908,0200,124C ;2228           VA_RC[1]                ; VA=19999000
```

```
U 124C, 0810,0038,0180,0900,0000,124D    ;2229            D_RC[0]                       ; DATA=AAAAAAAA
U 124D, 0000,003C,0180,9800,0000,10A4    ;2230            FS/MCT,MCT/VALIDATE           ; WRITE GROUP 0
U 10A4, 0000,003D,0180,0800,0000,1225    ;2231    =0      CALL,J/R1S                    ; SET FORCE REPLACE GROUP 1 BIT
U 10A5, 0010,0038,0180,0918,0200,124E    ;2232            VA_RC[3]                      ; VA=06666000
U 124E, 0810,0038,0180,0910,0000,124F    ;2233            D_RC[2] ; DATA=55555555
U 124F, 0000,003C,0180,9800,0000,10A6    ;2234            FS/MCT,MCT/VALIDATE           ; WRITE GROUP 1
U 10A6, 0000,003D,0180,0800,0000,121D    ;2235    =0      CALL,J/SOFF                   ; CLEAR FORCE REPLACE BITS
U 10A7, 0018,0038,6580,0A80,0000,1250    ;2236            R[0]_K[.10]                   ; INITIALIZE A COUNTER
U 1250, 0000,003C,6180,0800,0084,7251    ;2237            SC_K[.F]                      ; GENERATE AN ADDRESS MASK
U 1251, 0803,0010,0180,0800,0000,1252    ;2238            ALU_MASK+1,D_ALU
U 1252, 0200,003C,0180,0800,0000,1253    ;2239            D_D.RIGHT2,SI/ZERO
U 1253, 0600,003C,0180,0800,0000,1254    ;2240            D_D.RIGHT,SI/ZERO
U 1254, 0001,003C,0180,0A88,0000,10A8    ;2241            R[1]_D                        ; R[1]=1FFFE000
U 10A8, 0000,003D,0180,0800,0000,11CB    ;2242    =0      ERLOOP
U 10A9, 0800,003C,0180,0A00,0000,1255    ;2243    COMG1A: D_R[0]                        ; GENERATE TEST PATTERNS OF
U 1255, 0018,0038,85C0,0800,0000,1256    ;2244            Q_K[.C]                       ; TAG= 1 IN 0'S AND TAG= 0 IN 1'S
U 1256, 001D,2014,0180,0A90,0082,1257    ;2245            ALU_Q+D,SC_ALU,R[2]_ALU
U 1257, 0600,0024,0180,0A08,0000,1258    ;2246            ALU_R[1].ANDNOT.MASK,D_ALU
U 1258, 0001,003C,0180,0A98,0000,1259    ;2247            R[3]_D
U 1259, 0800,0034,0180,0A08,0000,125A    ;2248            ALU_R[1].AND.MASK,D_ALU
U 125A, 0001,003C,0180,0AA0,0000,10AA    ;2249            R[4]_D
U 10AA, 0000,003D,0180,0800,0000,1225    ;2250    =0      CALL,J/R1S                    ; SET FORCE REPLACE GROUP 1 BIT
U 10AB, 0018,0038,1980,09F0,0200,125B    ;2251            VA_K[ZERO],RC[0E]_ALU         ; MAKE 0 A HIT IN GROUP 1
U 125B, 0810,0038,0180,0920,0000,125C    ;2252            D_RC[4]                       ; DATA=99999999
U 125C, 0000,003C,0180,9800,0000,10AC    ;2253            FS/MCT,MCT/VALIDATE           ; WRITE GROUP 1
U 10AC, 0000,003D,0180,0800,0000,121D    ;2254    =0      CALL,J/SOFF                   ; CLEAR FORCE REPLACE BITS
U 10AD, 0800,003C,0180,0A18,0200,125D    ;2255            VA_R[3],D_R[3]                ; REFERENCE 1 IN 0'S ADDRESS PATTERN
U 125D, 0001,003C,0180,09C0,0000,1004    ;2256            RC[8]_D         ; WHILE 0 IS A HIT
U 1004, 0000,003D,0180,0800,0000,1086    ;2257    =00     CALL,J/RMOM1                  ; 1 IN 0'S PATTERN SHOULD BE A MISS
U 1005, 0000,003D,0180,0800,0000,11CC    ;2258            ERROR1                        ; UNEXPECTED UTRAP OCCURRED
U 1006, 0000,003D,0180,0800,0000,11CC    ;2259            ERROR1                        ; HIT/MISS BITS INCORRECT
U 1007, 0018,0038,1980,09C0,0200,125E    ;2260            VA_K[ZERO],RC[8]_ALU          ; REFERNCE 0
U 125E, 0010,0038,01C0,0920,0000,1008    ;2261            Q_RC[4]
U 1008, 0001,203D,0180,09D8,0000,1084    ;2262    =00     CALL,J/RMOH1,RC[0B]_Q         ; SHOULD BE A HIT
U 1009, 0000,003D,0180,0800,0000,11CC    ;2263            ERROR1                        ; UNEXPECTED UTRAP OCCURRED
U 100A, 0000,003D,0180,0800,0000,11CC    ;2264            ERROR1                        ; HIT/MISS BITS INCORRECT
U 100B, 001D,2000,0180,0800,0010,125F    ;2265            ALU_Q-D,CLK.UBCC              ; DATA AT 0 SHOULD BE=99999999
U 125F, 0000,013C,0180,0800,0000,10AE    ;2266            Z?
U 10AE, 0000,003D,0180,0800,0000,11CC    ;2267    =0      ERROR1                        ; DATA INCORRECT
U 10AF, 0000,003C,0180,0800,0000,10B0    ;2268            NOP
U 10B0, 0000,003D,0180,0800,0000,1225    ;2269    =0      CALL,J/R1S                    ; SET FORCE REPLACE GROUP 1 BIT
U 10B1, 0800,003C,0180,0A18,0200,1260    ;2270            VA_R[3],D_R[3]                ; MAKE 1 IN 0'S ADDRESS PATTERN
U 1260, 0001,003C,0180,09F0,0000,1261    ;2271            RC[0E]_D                      ; A HIT IN GROUP 1
U 1261, 0810,0038,0180,0930,0000,1262    ;2272            D_RC[6]                       ; DATA=66666666
U 1262, 0000,003C,0180,9800,0000,10B2    ;2273            FS/MCT,MCT/VALIDATE           ; WRITE GROUP 1
U 10B2, 0000,003D,0180,0800,0000,121D    ;2274    =0      CALL,J/SOFF                   ; CLEAR FORCE REPLACE BITS
U 10B3, 0018,0038,1980,09C0,0200,100C    ;2275            VA_K[ZERO],RC[8]_ALU          ; REFERENCE 0 WITH
                                         ;2276                                          ; 1 IN 0'S PATTERN A HIT
U 100C, 0000,003D,0180,0800,0000,1086    ;2277    =00     CALL,J/RMOM1                  ; 0 SHOUL BE A MISS
U 100D, 0000,003D,0180,0800,0000,11CC    ;2278            ERROR1                        ; UNEXPECTED UTRAP OCCURRED
U 100E, 0000,003D,0180,0800,0000,11CC    ;2279            ERROR1                        ; HIT/MISS BITS INCORRECT
U 100F, 0800,003C,0180,0A18,0200,1263    ;2280            VA_R[3],D_R[3]                ; REFERENCE 1 IN 0'S PATTERN
U 1263, 0001,003C,0180,09C0,0000,1264    ;2281            RC[8]_D
U 1264, 0010,0038,01C0,0930,0000,1010    ;2282            Q_RC[6]
U 1010, 0001,203D,0180,09D8,0000,1084    ;2283    =00     CALL,J/RMOH1,RC[0B]_Q         ; SHOULD BE A HIT IN GROUP 1
```

```
U 1011, 0000,003D,0180,0800,0000,11CC   ;2284           ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 1012, 0000,003D,0180,0800,0000,11CC   ;2285           ERROR1                  ; HIT/MISS BITS INCORRECT
U 1013, 001D,2000,0180,0800,0010,1265   ;2286           ALU_Q-D,CLK.UBCC        ; DATA SHOULD BE 66666666
U 1265, 0000,013C,0180,0800,0000,10B4   ;2287           Z?
U 10B4, 0000,003D,0180,0800,0000,11CC   ;2288   =0      ERROR1                  ; DATA INCORRECT
U 10B5, 0000,003C,0180,0800,0000,10B6   ;2289           NOP
U 10B6, 0000,003D,0180,0800,0000,1225   ;2290   =0      CALL,J/R1S              ; SET FORCE REPLACE GROUP 1 BIT
U 10B7, 0800,003C,0180,0A08,0200,1266   ;2291           VA_R[1],D_R[1]          ; MAKE ADDRESS 1FFFE000 A HIT IN GROUP 1
U 1266, 0001,003C,0180,09F0,0000,1267   ;2292           RC[0E]_D
U 1267, 0810,0038,0180,0920,0000,1268   ;2293           D_RC[4]                 ; DATA=99999999
U 1268, 0000,003C,0180,9800,0000,10B8   ;2294           FS/MCT,MCT/VALIDATE     ; WRITE GROUP 1
U 10B8, 0000,003D,0180,0800,0000,121D   ;2295   =0      CALL,J/SOFF             ; CLEAR FORCE REP[LACE BITS
U 10B9, 0800,003C,0180,0A20,0200,1269   ;2296           VA_R[4],D_R[4]          ; REFERENCE ADDRESS PATTERN=0 IN 1'S
U 1269, 0001,003C,0180,09C0,0000,1014   ;2297           RC[8]_D
U 1014, 0000,003D,0180,0800,0000,1086   ;2298   =00     CALL,J/RMOM1            ; SHOULD BE A MISS
U 1015, 0000,003D,0180,0800,0000,11CC   ;2299           ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 1016, 0000,003D,0180,0800,0000,11CC   ;2300           ERROR1                  ; HIT/MISS BITS INCORRECT
U 1017, 0800,003C,0180,0A08,0200,126A   ;2301           VA_R[1],D_R[1]          ; REFERENCE 1FFFE000
U 126A, 0001,003C,0180,09C0,0000,126B   ;2302           RC[8]_D
U 126B, 0010,0038,01C0,0920,0000,1018   ;2303           Q_RC[4]
U 1018, 0001,203D,0180,09D8,0000,1084   ;2304   =00     CALL,J/RMOH1,RC[0B]_Q   ; SHOULD BE A HIT
U 1019, 0000,003D,0180,0800,0000,11CC   ;2305           ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 101A, 0000,003D,0180,0800,0000,11CC   ;2306           ERROR1                  ; HIT/MISS BITS INCORRECT
U 101B, 001D,2000,0180,0800,0010,126C   ;2307           ALU_Q-D,CLK.UBCC        ; DATA SHOULD BE 99999999
U 126C, 0000,013C,0180,0800,0000,10BA   ;2308           Z?
U 10BA, 0000,003D,0180,0800,0000,11CC   ;2309   =0      ERROR1                  ; DATA INCORRECT
U 10BB, 0000,003C,0180,0800,0000,10BC   ;2310           NOP
U 10BC, 0000,003D,0180,0800,0000,1225   ;2311   =0      CALL,J/R1S              ; SET FORCE REPLACE GROUP 1 BIT
U 10BD, 0800,003C,0180,0A20,0200,126D   ;2312           VA_R[4],D_R[4]          ; MAKE 0 IN 1'S ADDRESS PATTERN A HIT
U 126D, 0001,003C,0180,09F0,0000,126E   ;2313           RC[0E]_D
U 126E, 0810,0038,0180,0930,0000,126F   ;2314           D_RC[6]                 ; DATA=66666666
U 126F, 0000,003C,0180,9800,0000,10BE   ;2315           FS/MCT,MCT/VALIDATE     ; WRITE GROUP 1
U 10BE, 0000,003D,0180,0800,0000,121D   ;2316   =0      CALL,J/SOFF             ; CLEAR FORCE REPLACE BITS
U 10BF, 0800,003C,0180,0A08,0200,1270   ;2317           VA_R[1],D_R[1]          ; REFERNCE ADDRESS 1FFFE000
U 1270, 0001,003C,0180,09C0,0000,101C   ;2318           RC[8]_D                 ; WHILE 0 IN 1'S PATTERN IS A HIT
U 101C, 0000,003D,0180,0800,0000,1086   ;2319   =00     CALL,J/RMOM1            ; 1FFFE000 SHOULD BE A MISS
U 101D, 0000,003D,0180,0800,0000,11CC   ;2320           ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 101E, 0000,003D,0180,0800,0000,11CC   ;2321           ERROR1                  ; HIT/MISS BITS INCORRECT
U 101F, 0800,003C,0180,0A20,0200,1271   ;2322           VA_R[4],D_R[4]          ; REFERENCE 0 IN 1'S PATTERN
U 1271, 0001,003C,0180,09C0,0000,1272   ;2323           RC[8]_D
U 1272, 0010,0038,01C0,0930,0000,1020   ;2324           Q_RC[6]
U 1020, 0001,203D,0180,09D8,0000,1084   ;2325   =00     CALL,J/RMOH1,RC[0B]_Q   ; SHOULD BE A HIT
U 1021, 0000,003D,0180,0800,0000,11CC   ;2326           ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 1022, 0000,003D,0180,0800,0000,11CC   ;2327           ERROR1                  ; HIT/MISS BITS INCORRECT
U 1023, 001D,2000,0180,0800,0010,1273   ;2328           ALU_Q-D,CLK.UBCC        ; DATA SHOULD BE 66666666
U 1273, 0000,013C,0180,0800,0000,10C0   ;2329           Z?
U 10C0, 0000,003D,0180,0800,0000,11CC   ;2330   =0      ERROR1                  ; DATA INCORRECT
U 10C1, 0000,003C,0180,0800,0000,1274   ;2331           NOP
U 1274, 0000,003C,0180,0A00,0010,1275   ;2332           ALU_R[0],CLK.UBCC       ; TRIED ALL PATTERNS?
U 1275, 0000,013C,0180,0800,0000,10C2   ;2333           Z?
U 10C2, 0018,0000,0580,0A80,0000,10A9   ;2334   =0      R[0]_LA-K[.1],J/COMG1A  ; IF NOT CONTINUE
U 10C3, 0810,0038,0180,0908,0200,1276   ;2335           VA_RC[1],D_RC[1]        ; CHECK HIT AT 19999000 IN GROUP
U 1276, 0001,003C,0180,09F0,0000,1277   ;2336           RC[0E]_D                ; 0
U 1277, 0001,003C,0180,09C0,0000,1278   ;2337           RC[8]_D
U 1278, 0010,0038,01C0,0900,0000,1024   ;2338           Q_RC[0]
```

```
U 1024, 0001,203D,0180,09D8,0000,1082   ;2339   =00     CALL,J/RHOM1,RC[OB]_Q
U 1025, 0000,003D,0180,0800,0000,11CC   ;2340           ERROR1                  ; UNEXPECTED UTRAP OCCURRED
U 1026, 0000,003D,0180,0800,0000,11CC   ;2341           ERROR1                  ; HIT/MISS BITS INCORRECT
U 1027, 001D,2000,0180,0800,0010,1279   ;2342           ALU_Q-D,CLK.UBCC        ; DATA SHOULD BE AAAAAAAA
U 1279, 0000,013C,0180,0800,0000,10C4   ;2343           Z?
U 10C4, 0000,003D,0180,0800,0000,11CC   ;2344   =0      ERROR1                  ; DATA INCORRECT
U 10C5, 0000,003C,0180,0800,0000,10C6   ;2345           NOP
```

```
                                         ;2346          .PAGE   "TEST D7        ADDRESS PARITY LOGIC TEST"
                                         ;2347   ;*******************************************************************
                                         ;2348   ;++
                                         ;2349   ; TEST  D7      ADDRESS PARITY LOGIC TEST
                                         ;2350   ;
                                         ;2351   ; TEST DESCRIPTION
                                         ;2352   ;      THIS IS A TEST OF THE PARITY ERROR DETECTION LOGIC ON THE
                                         ;2353   ;      CAM AND SBI BOARDS. THE MAINTENANCE FEATURES OF THE SBI
                                         ;2354   ;      MAINTENANCE REGISTER ARE USED TO FORCE PARITY ERRORS
                                         ;2355   ;      AT EACH ADDRESS PARITY CHECKER. AFTER EACH ERROR THE PARITY
                                         ;2356   ;      ERROR REGISTER IS CHECKED TO MAKE SURE THAT A CORRECT INDICATION
                                         ;2357   ;      OF WHAT HAPPENED IS PRESENTED.
                                         ;2358   ;
                                         ;2359   ; LOGIC DESCRIPTION
                                         ;2360   ;      TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                         ;2361   ;      PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                         ;2362   ;      THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                         ;2363   ;      TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                         ;2364   ;      CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                         ;2365   ;      IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                         ;2366   ;      IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                         ;2367   ;      ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                         ;2368   ;      REGISTER ON THE SBI CONTROL MODULE.
                                         ;2369   ;
                                         ;2370   ; ERROR DESCRIPTION
                                         ;2371   ;      VA REFERENCED
                                         ;2372   ;      DATA WRITTEN
                                         ;2373   ;      EXPECTED CACHE PARITY REGISTER, ID[PARITY]
                                         ;2374   ;      GOT CACHE PARITY REGISTER, ID[PARITY]
                                         ;2375   ;      WROTE CACHE MAINTENANCE REGISTER
                                         ;2376   ;      GOT CACHE MAINT REGISTER
                                         ;2377   ;      UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                         ;2378   ;              FLAG            UTRAP TYPE
                                         ;2379   ;              ----            ----------
                                         ;2380   ;              1DE             NO UTRAP OCCURRED
                                         ;2381   ;              DE              CACHE PARITY UTRAP
                                         ;2382   ;              15E             TB PARITY ERROR
                                         ;2383   ;              19E             TB MISS
                                         ;2384   ;              1CE             TB PROTECTION ERROR
                                         ;2385   ;              1D6             TB MODIFY BIT ERROR
                                         ;2386   ;              1DA             X PAGE UTRAP
                                         ;2387   ;              1DC             UNALIGNED DATA UTRAP
                                         ;2388   ;      ERROR CODE: (FOR FAILCHAIN)
                                         ;2389   ;              0=> ID [MAINT] INCORRECT
                                         ;2390   ;              1=> ID[PARITY] INCORRECT
                                         ;2391   ;              2=> PARITY SIGNALS OR PARITY UTRAP DECODE LOGIC FAILURES
                                         ;2392   ;
                                         ;2393   ;--
                                         ;2394   ;*******************************************************************
                                         ;2395   =0
U 10C6, 0000,003D,0180,0800,0000,11B8    ;2396   APARO:  NEWTST
U 10C7, 0F18,0038,0180,09F8,0000,10C8    ;2397           D_0,RC[OF]_K[.8]
U 10C8, 0000,003D,4980,3C00,0000,1232    ;2398   =0      ID[TBERO]_D,CALL,J/CAPAT ; TB OFF, GET TEST PATTERNS
U 10C9, 0000,003C,0180,0800,0000,10CA    ;2399           NOP
U 10CA, 0000,003D,0180,0800,0000,121D    ;2400   =0      CALL,J/SOFF              ; TURN OFF SBI CYCLES
```

```
U 10CB, 0F18,0038,1980,0800,0200,127A   ;2401           VA_K[ZERO],D_0            ; INVALIDATE LOCATIO 0
U 127A, 0000,003C,0180,9000,0000,10CC   ;2402           FS7MCT,MCT/INVALIDATE     ; OF BOTH GROUPS
U 10CC, 0F00,003D,0180,0800,0000,11D5   ;2403   =0      D_0,CALL,J/DC.1DE         ; GET UTRAP FLAG
U 10CD, 0001,003C,0180,0AF0,0000,127B   ;2404           R[0E]_D
U 127B, 0003,003C,0180,0AF8,0000,127C   ;2405           R[0F]_0
U 127C, 0818,0038,D5F8,0800,0000,127D   ;2406           D_K[.6],Q_0
U 127D, 0000,003C,0180,0800,0084,727E   ;2407           SC_K[.8]
U 127E, 0D00,003C,0180,0800,0000,127F   ;2408           D_DAL.SC
U 127F, 0001,003C,0180,0A98,0000,10CE   ;2409           R[3]_D                    ; R[3]=600, USED AS MAINT REG. MASK
U 10CE, 0F00,003D,0180,0800,0000,11F4   ;2410   =0      D_0,CALL,J/DCLA           ; GENERATE ADDRESS WHICH
U 10CF, 0000,003C,65F8,0800,0084,7280   ;2411           SC_K[.10],Q_0             ; WILL BE A HIT IN BOTH
U 1280, 0D00,003C,0180,0800,0000,1281   ;2412           D_DAL.SC                  ; GROUPS WHEN THE REFERENCE
U 1281, 0200,003C,0180,0800,0000,1282   ;2413           D_D.RIGHT2,SI/ZERO        ; WHICH WILL CAUSE A PARITY ERROR IS MADE
U 1282, 0200,003C,0180,0800,0000,1283   ;2414           D_D.RIGHT2,SI/ZERO
U 1283, 0001,003C,0180,09B8,0000,10D0   ;2415           RC[7]_D                   ; RC[7]=0AAAA000 TEST ADDRESS
U 10D0, 0000,003D,0180,0800,0000,1221   ;2416   =0      CALL,J/R0S                ; SET FORCE REPLACE GROUP 0 BIT
U 10D1, 0810,0038,0180,0938,0200,1284   ;2417           VA_RC[7],D_RC[7]                  ; VA=0AAAA000
U 1284, 0001,003C,0180,09F0,0000,1285   ;2418           RC[0E]_D
U 1285, 0810,0038,0180,0920,0000,1286   ;2419           D_RC[4]                   ; DATA=99999999
U 1286, 0001,003C,0180,09E8,0000,1287   ;2420           RC[0D]_D
U 1287, 0000,003C,0180,9800,0000,10D2   ;2421           FS/MCT,MCT/VALIDATE       ; WRITE ADDRESS 0AAAA000 INTO GROUP 0
U 10D2, 0000,003D,0180,0800,0000,1231   ;2422   =0      CALL,J/R1M0S              ; SET FORCE MISS TO 0 AND REPLACE GROUP 1 BITS
U 10D3, 0010,0038,0180,0938,0200,1288   ;2423           VA_RC[7]                  ; MAKE 0AAAA000 A HIT IN GROUP 1
U 1288, 0810,0038,0180,0920,0000,1289   ;2424           D_RC[4]                   ; DATA=99999999
U 1289, 0000,003C,0180,9800,0000,10D4   ;2425           FS/MCT,MCT/VALIDATE       ; WRITE GROUP 1
U 10D4, 0000,003D,0180,0800,0000,121D   ;2426   =0      CALL,J/SOFF               ; CLEAR FORCE REPLACE AND FORCE MISS BITS
U 10D5, 0818,0038,1180,0800,0000,128A   ;2427           D_K[.4]
U 128A, 0019,0014,0580,0A80,0000,128B   ;2428           ALU_D+K[.1],R[0]_ALU      ; INITIALIZE A COUNT, R[0]=5
U 128B, 0000,003C,6580,0800,0084,728C   ;2429           SC_K[.10]                 ; GENERATE SOME CONSTANTS USED IN THE TEST
U 128C, 0000,003C,0580,0800,0084,928D   ;2430           SC_SC+K[.1]
U 128D, 0803,001C,8580,0AB0,0084,728E   ;2431           ALU_NOT.MASK,D_ALU,R[6]_ALU,SC_K[.C]
U 128E, 0001,001C,0180,0AB8,0000,128F   ;2432           ALU_D.ORNOT.MASK,R[7]_ALU
U 128F, 0018,0038,0980,0A88,0000,1290   ;2433           R[1]_K[.2]
U 1290, 0018,0038,C180,0AC0,0000,10D6   ;2434           R[8]_K[.FFFF]
U 10D6, 0000,003D,0180,0800,0000,11CB   ;2435   =0      ERLOOP
U 10D7, 0F03,003C,0180,09D0,0000,1291   ;2436   APAR1:  D_0,RC[0A]_0
U 1291, 0000,003C,7580,3C00,0000,1292   ;2437           ID[MAINT]_D               ; TRY TO CLEAR THE MAINT REGISTER
U 1292, 0000,003C,75F0,2C00,0000,1293   ;2438           Q_ID[MAINT]               ; READ THE MAINT REGISTER AND
U 1293, 0001,203C,0180,09C8,0000,1294   ;2439           RC[9]_Q
U 1294, 000D,2024,0180,0A18,0010,1295   ;2440           LAB_R[3],ALU_Q[ANDNOT]LB,CLK.UBCC ; SEE IF IT WAS CLEARED.
U 1295, 0000,013C,0180,0800,0000,10D8   ;2441           Z?
U 10D8, 0003,003D,0180,09B8,0000,11CC   ;2442   =0      ERROR1,RC[7]_0            ; ID[MAINT] INCORRECT
U 10D9, 0818,0038,4580,0800,0000,1296   ;2443           D_K[.8000]
U 1296, 0000,003C,7980,3C00,0000,1297   ;2444           ID[PARITY]_D              ; TRY TO CLEAR THE PARITY REGISTER
U 1297, 0600,003C,0180,0800,0000,1298   ;2445           D_D.RIGHT,SI/ZERO
U 1298, 0001,003C,79F0,2DE0,0000,1299   ;2446           RC[0C]_D,Q_ID[PARITY]     ; READ THE PARITY REGISTER
U 1299, 0001,203C,0180,09D8,0000,129A   ;2447           RC[0B]_Q
U 129A, 001D,2000,0180,0800,0010,129B   ;2448           ALU_Q-D,CLK.UBCC          ; SEE IF THE PARITY REGISTER CLEARED.
U 129B, 0000,013C,0180,0800,0000,10DA   ;2449           Z?
U 10DA, 0018,0039,0580,09B8,0000,11CC   ;2450   =0      ERROR1,RC[7]_K[.1]        ; ID[PARITY] INCORRECT
U 10DB, 0800,003C,0180,0A38,0000,129C   ;2451           D_R[7]
U 129C, 0001,003C,0180,09D0,0000,129D   ;2452           RC[0A]_D
U 129D, 0000,003C,7580,3C00,0000,129E   ;2453           ID[MAINT]_D               ; SET THE FORCE ERROR BITS IN ID[MAINT]
U 129E, 0000,003C,75F0,2C00,0000,129F   ;2454           Q_ID[MAINT]               ; READ MAINT REGISTER BACK
U 129F, 0001,203C,0180,09C8,0000,12A0   ;2455           RC[9]_Q
```

```
U 12A0, 0000,2024,01C0,0A18,0000,12A1    ;2456               LAB_R[3],ALU_Q[ANDNOT]LB,Q_ALU
U 12A1, 001D,2000,0180,0800,0010,12A2    ;2457               ALU_Q-D,CLK.UBCC        ; SEE IF FORCE ERROR BITS CORRECT
U 12A2, 0000,013C,0180,0800,0000,10DC    ;2458               Z?
U 10DC, 0003,003D,0180,09B8,0000,11CC    ;2459      =0       ERROR1,RC[7]_0          ; ID[MAINT] INCORRECT
U 10DD, 0800,003C,0180,0A40,0000,12A3    ;2460               D_R[8]
U 12A3, 0000,003C,0180,0A08,0082,12A4    ;2461               SC_R[1]
U 12A4, 0801,0034,0180,09E0,0000,12A5    ;2462               ALU_D.AND.MASK,D_ALU,RC[0C]_ALU
U 12A5, 0018,0038,1980,0800,0200,12A6    ;2463               VA_K[ZERO]              ; SET VA=0
U 12A6, 0000,003C,0180,0A70,0000,12A7    ;2464               LAB_R[0E]               ; INITIALIZE UTRAP FLAG
U 12A7, 0000,003C,0180,0AF8,0000,12A8    ;2465               R[0F]_LA
U 12A8, 0000,003C,0180,5000,0000,12A9    ;2466               FS/MCT,MCT/READ.V.WCHK  ; SHOULD UTRAP BECAUSE OF
                                         ;2467                                       ; CACHE PARITY ERROR.
U 12A9, 0800,003C,0180,0A78,0000,12AB    ;2468               D_R[0F]                 ; SEE IF UTRAP OCCURRED
U 12AB, 0003,003C,0180,0AF8,0000,12AC    ;2469               R[0F]_0
U 12AC, 0000,003C,01C0,0A70,0000,12AD    ;2470               Q_R[0E]
U 12AD, 0001,003C,0180,09C0,0000,12AE    ;2471               RC[8]_D
U 12AE, 001D,2000,0180,0800,0010,12AF    ;2472               ALU_Q-D,CLK.UBCC
U 12AF, 0000,013C,0180,0800,0000,10DE    ;2473               Z?
U 10DE, 0000,003C,0180,0800,0000,12B0    ;2474      =0       J/APAR2
U 10DF, 0018,0039,0980,09B8,0000,11CC    ;2475               ERROR1,RC[7]_K[.2]      ; NO UTRAP
U 12B0, 0000,003C,0180,0800,0084,72B1    ;2476      APAR2:   SC_K[.8]                ; SEE IF UTRAP WAS CACHE PARITY UTRAP
U 12B1, 0001,0024,0180,0800,0010,12B2    ;2477               ALU_D.ANDNOT.MASK,CLK.UBCC
U 12B2, 0000,013C,0180,0800,0000,10E0    ;2478               Z?
U 10E0, 0018,0039,0580,09B8,0000,11CC    ;2479      =0       ERROR1,RC[7]_K[.1]      ; UTRPPED BUT NOT CACHE PARITY
U 10E1, 0000,003C,79F0,2C00,0000,12B3    ;2480               Q_ID[PARITY]            ; GET CACHE PARITY REGISTER
U 12B3, 0001,203C,0180,09D8,0000,12B4    ;2481               RC[0B]_Q
U 12B4, 0810,0038,0180,0960,0000,12B5    ;2482               D_RC[0C]
U 12B5, 001D,2000,0180,0800,0010,12B6    ;2483               ALU_Q-D,CLK.UBCC        ; WAS PARITY REGISTER CORRECT?
U 12B6, 0000,013C,0180,0800,0000,10E2    ;2484               Z?
U 10E2, 0018,0039,0980,09B8,0000,11CC    ;2485      =0       ERROR1,RC[7]_K[.2]      ; ID[PARITY] INCORRECT
U 10E3, 0F03,003C,0180,09D0,0000,12B7    ;2486               D_0,RC[0A]_0
U 12B7, 0000,003C,7580,3C00,0000,12B8    ;2487               ID[MAINT]_D             ; CLEAR MAINT FORCE PARITY ERROR BITS
U 12B8, 0000,003C,75F0,2C00,0000,12B9    ;2488               Q_ID[MAINT]             ; READ MAINT REGISTER AND SEE IF IT IS CLEAR
U 12B9, 0001,203C,0180,09C8,0000,12BA    ;2489               RC[9]_Q
U 12BA, 000D,2024,0180,0A18,0010,12BB    ;2490               LAB_R[3],ALU_Q[ANDNOT]LB,CLK.UBCC
U 12BB, 0000,013C,0180,0800,0000,10E4    ;2491               Z?
U 10E4, 0003,003D,0180,09B8,0000,11CC    ;2492      =0       ERROR1,RC[7]_0          ; ID[MAINT] INCORRECT
U 10E5, 0818,0038,4580,0800,0000,12BC    ;2493               D_K[.8000]
U 12BC, 0000,003C,7980,3C00,0000,12BD    ;2494               ID[PARITY]_D            ; CLEAR PARITY REGISTER
U 12BD, 0600,003C,0180,0800,0000,12BE    ;2495               D_D.RIGHT,SI/ZERO
U 12BE, 0001,003C,79F0,2DE0,0000,12BF    ;2496               RC[0C]_D,Q_ID[PARITY]   ; READ PARITY REGISTER
U 12BF, 0001,203C,0180,09D8,0000,12C0    ;2497               RC[0B]_Q
U 12C0, 001D,2000,0180,0800,0010,12C1    ;2498               ALU_Q-D,CLK.UBCC
U 12C1, 0000,013C,0180,0800,0000,10E6    ;2499               Z?
U 10E6, 0018,0039,0580,09B8,0000,11CC    ;2500      =0       ERROR1,RC[7]_K[.1]      ; ID[PARITY] INCORRECT
U 10E7, 0000,003C,0180,0A08,0010,12C2    ;2501               ALU_R[1],CLK.UBCC
U 12C2, 0000,013C,0180,0800,0000,10E8    ;2502               Z?
U 10E8, 0018,0000,0580,0A88,0000,12C4    ;2503      =0       R[1]_LA-K[.1],J/APAR3
U 10E9, 0818,0038,1180,0800,0000,12C3    ;2504               D_K[.4]
U 12C3, 0019,0014,0580,0A88,0000,12C4    ;2505               ALU_D+K[.1],R[1]_ALU
U 12C4, 0800,003C,0180,0A30,0000,12C5    ;2506      APAR3:   D_R[6]                  ; GENERATE NEW DATA FOR NEXT TEST
U 12C5, 0000,003C,01C0,0A38,0000,12C6    ;2507               Q_R[7]
U 12C6, 001D,2014,0180,0AB8,0000,12C7    ;2508               ALU_Q+D,R[7]_ALU
U 12C7, 0000,003C,0180,0A00,0010,12C8    ;2509               ALU_R[0],CLK.UBCC       ; ARE ALL ADDRESS PARITY CHECKERS TESTED?
U 12C8, 0000,013C,0180,0800,0000,10EA    ;2510               Z?
```

```
U 10EA, 0018,0000,0580,0A80,0000,10D7   ;2511    =0      R[0]_LA-K[.1],J/APAR1   ; CONTINUE
U 10EB, 0000,003C,0180,0800,0000,10EC   ;2512            NOP                     ; DONE
```

```
                                                  .PAGE   "TEST D8        DATA PARITY LOGIC TEST"
                                          ;*****************************************************************
                                          ;++
                                          ; TEST  D8      DATA PARITY LOGIC TEST
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS IS A TEST OF THE CACHE DATA MEMORY PARITY ERROR
                                          ;       DETECTION LOGIC. A PARITY ERROR IS FORCED AT
                                          ;       EA:H PARITY CHECKER USING THE MAINTENANCE FEATURES OF THE
                                          ;       SB' MAINTENANCE REGISTER. A MICRO TRAP WILL
                                          ;       RESULT AND THE APPROPRIATE BITS SHOULD GET SET IN THE
                                          ;       SBI PARITY ERROR REGSIETR.
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                          ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                          ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                          ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                          ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                          ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                          ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                          ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                          ;       REGISTER ON THE SBI CONTROL MODULE.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       VA REFERENCED
                                          ;       DATA WRITTEN
                                          ;       EXPECTED CACHE PARITY REGISTER, ID[PARITY]
                                          ;       GOT CACHE PARITY REGISTER, ID[PARITY]
                                          ;       WROTE CACHE MAINTENANCE REGISTER
                                          ;       GOT CACHE MAINT REGISTER
                                          ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                          ;               FLAG            UTRAP TYPE
                                          ;               ----            ----------
                                          ;               1DE             NO UTRAP OCCURRED
                                          ;               DE              CACHE PARITY UTRAP
                                          ;               15E             TB PARITY ERROR
                                          ;               19E             TB MISS
                                          ;               1CE             TB PROTECTION ERROR
                                          ;               1D6             TB MODIFY BIT ERROR
                                          ;               1DA             X PAGE UTRAP
                                          ;               1DC             UNALIGNED DATA UTRAP
                                          ;       ERROR CODE: (FOR FAILCHAIN)
                                          ;               0=>ID[MAINT] REGISTER INCORRECT
                                          ;               1=>ID[PARITY] REGISTER INCORRECT
                                          ;               2=> PARITY SIGNALS OR PARITY UTRAP DECODE LOGIC FAILURES
                                          ;
                                          ;--
                                          ;*****************************************************************
                                          =0
U 10EC, 0000,003D,0180,0800,0000,11B8     DPAR0:  NEWTST
U 10ED, 0F18,0038,0180,09F8,0000,10EE             D_0,RC[0F]_K[.8]
U 10EE, 0000,003D,4980,3C00,0000,1232     =0      ID[TBER0]_D,CALL,J/CAPAT ; TB OFF, AND GET TEST DATA PATTERNS
U 10EF, 0000,003C,0180,0800,0000,10F0             NOP
U 10F0, 0000,003D,0180,0800,0000,121D     =0      CALL,J/SOFF              ; TURN SBI CYCLES OFF
```

```
U 10F1, 0F18,0038,1980,0800,0200,12C9   ;2568            VA_K[ZERO],D_0           ; INVALIDATE LOCATION 0
U 12C9, 0000,003C,0180,9000,0000,10F2   ;2569            FS7MCT,MCT/INVALIDATE    ; BOTH GROUPS
U 10F2, 0F00,003D,0180,0800,0000,11D5   ;2570   =0       D_0,CALL,J/DC.1DE        ; GENERATE UTRAP FLAG
U 10F3, 0001,003C,0180,0AF0,0000,12CA   ;2571            R[0E]_D
U 12CA, 0003,003C,0180,0AF8,0000,12CB   ;2572            R[0F]_0
U 12CB, 0F18,0038,11C0,0800,0000,10F4   ;2573            Q_K[.4],D_0              ; GENERATE A DATA PATTERN WHICH
                                        ;2574   =0
U 10F4, 0000,003D,0180,0800,0000,11E5   ;2575   DPAR05:  CALL,J/DCA               ; WHEN WRITTEN INTO THE CACHE DATA
U 10F5, 0000,003C,0180,0800,0000,10F6   ;2576            NOP                      ; MEMORY CAN BE USED WITH THE
U 10F6, 0000,003D,0180,0800,0000,11E8   ;2577   =0       CALL,J/DCD               ; MAINTENANCE FUNCTION TO FORCE PARITY ERRORS.
U 10F7, 0001,203C,0180,0800,0010,12CC   ;2578            ALU_Q,CLK.UBCC
U 12CC, 0000,013C,0180,0800,0000,10F8   ;2579            Z?
U 10F8, 0019,2000,05C0,0800,0000,10F4   ;2580   =0       Q_Q-K[.1],J/DPAR05
U 10F9, 0001,003C,0180,09B0,0000,12CD   ;2581            RC[06]_D                 ; DATA PATTERN=RC[06]=ADADADAD
U 12CD, 0818,0038,D580,0800,0000,12CE   ;2582            D_K[.6]
U 12CE, 0000,003C,01F8,0800,0084,72CF   ;2583            Q_0,SC_K[.8]
U 12CF, 0D00,003C,0180,0800,0000,12D0   ;2584            D_DAL.SC
U 12D0, 0001,003C,0180,0A98,0000,10FA   ;2585            R[3]_D                   ; R[3]=600, A MASK USED TO TEST ID[MAINT]
U 10FA, 0000,003D,0180,0800,0000,1221   ;2586   =0       CALL,J/R0S               ; SET FORCE REPLACE GROUP 0 BIT
U 10FB, 0810,0038,0180,0938,0200,12D1   ;2587            VA_RC[7],D_RC[7]         ; VA=04924000
U 12D1, 0001,003C,0180,09F0,0000,12D2   ;2588            RC[0E]_D
U 12D2, 0810,0038,0180,0930,0000,12D3   ;2589            D_RC[6]                  ; DATA=ADADADAD
U 12D3, 0001,003C,0180,09E8,0000,12D4   ;2590            RC[0D]_D
U 12D4, 0000,003C,0180,9800,0000,10FC   ;2591            FS/MCT,MCT/VALIDATE      ; WRITE GROUP 0
U 10FC, 0000,003D,0180,0800,0000,1231   ;2592   =0       CALL,J/R1M0S             ; SET FORCE MISS GROUP 0 AND REPLACE GROUP 1 BITS
U 10FD, 0010,0038,0180,0938,0200,12D5   ;2593            VA_RC[7]                 ; VA=04924000
U 12D5, 0810,0038,0180,0930,0000,12D6   ;2594            D_RC[6]                  ; DATA=ADADADAD
U 12D6, 0000,003C,0180,9800,0000,10FE   ;2595            FS/MCT,MCT/VALIDATE      ; WRITE GROUP 1
U 10FE, 0000,003D,0180,0800,0000,121D   ;2596   =0       CALL,J/S0FF              ; CLEAR FORCE REPLACE AND FORCE MISS BITS.
U 10FF, 0018,0038,F580,0A80,0000,12D7   ;2597            R[0]_K[.A]               ; GENERATE SOME CONSTANTS USED IN THE TEST
U 12D7, 0018,0038,5D80,0A88,0000,12D8   ;2598            R[1]_K[.7]               ; INITIALIZE A COUNTER
U 12D8, 0000,003C,6580,0800,0084,72D9   ;2599            SC_K[.10]
U 12D9, 0000,003C,0580,0800,0084,92DA   ;2600            SC_SC+K[.1]
U 12DA, 0803,001C,0D80,0AB0,0084,92DB   ;2601            ALU_NOT.MASK,D_ALU,R[6]_ALU,SC_SC+K[.3]
U 12DB, 0803,001C,8580,0800,0084,72DC   ;2602            ALU_NOT.MASK,D_ALU,SC_K[.C]
U 12DC, 0001,001C,0180,0AB8,0000,12DD   ;2603            ALU_D.ORNOT.MASK,R[7]_ALU
U 12DD, 0018,0038,C180,0AC0,0000,110A   ;2604            R[8]_K[.FFFF]
U 110A, 0000,003D,0180,0800,0000,11CB   ;2605   =0       ERLOOP
U 110B, 0F03,003C,0180,09D0,0000,12DE   ;2606   DPAR1:   D_0,RC[0A]_0
U 12DE, 0000,003C,7580,3C00,0000,12DF   ;2607            ID[MAINT]_D              ; TRY TO CLEAR THE MAINT REGISTER
U 12DF, 0000,003C,75F0,2C00,0000,12E0   ;2608            Q_ID[MAINT]              ; READ THE MAINTENANCE REGISTER
U 12E0, 0001,203C,0180,09C8,0000,12E1   ;2609            RC[9]_Q
U 12E1, 000D,2024,0180,0A18,0010,12E2   ;2610            LAB_R[3],ALU_Q[ANDNOT]LB,CLK.UBCC ; IS IT CLEAR?
U 12E2, 0000,013C,0180,0800,0000,1110   ;2611            Z?
U 1110, 0003,003D,0180,09B8,0000,11CC   ;2612   =0       ERROR1,RC[7]_0           ; ID[MAINT] INCORRECT
U 1111, 0818,0038,4580,0800,0000,12E3   ;2613            D_K[.8000]
U 12E3, 0000,003C,7980,3C00,0000,12E4   ;2614            ID[PARITY]_D             ; TRY TO CLEAR THE PARITY ERROR REGISTER
U 12E4, 0600,003C,0180,0800,0000,12E5   ;2615            D_D.RIGHT,SI/ZERO
U 12E5, 0001,003C,79F0,2DE0,0000,12E6   ;2616            RC[0C]_D,Q_ID[PARITY]    ; READ THE PARITY REGISTER.
U 12E6, 0001,203C,0180,09D8,0000,12E7   ;2617            RC[0B]_Q
U 12E7, 001D,2000,0180,0800,0010,12E8   ;2618            ALU_Q-D,CLK.UBCC         ; IS IT CLEAR?
U 12E8, 0000,013C,0180,0800,0000,1112   ;2619            Z?
U 1112, 0018,0039,0580,09B8,0000,11CC   ;2620   =0       ERROR1,RC[7]_K[.1]       ; ID[PARITY] INCORRECT
U 1113, 0800,003C,0180,0A38,0000,12E9   ;2621            D_R[7]
U 12E9, 0001,003C,0180,09D0,0000,12EA   ;2622            RC[0A]_D
```

```
U 12EA, 0000,003C,7580,3C00,0000,12EB   ;2623             ID[MAINT]_D                ; SET FORCE PARITY ERROR BITS.
U 12EB, 0000,003C,75F0,2C00,0000,12EC   ;2624             Q_ID[MAINT]                ; SEE IF BITS GOT SET.
U 12EC, 0001,203C,0180,09C8,0000,12ED   ;2625             RC[9]_Q
U 12ED, 000D,2024,01C0,0A18,0000,12EE   ;2626             LAB_R[3],ALU_Q[ANDNOT]LB,Q_ALU
U 12EE, 001D,2000,0180,0800,0010,12EF   ;2627             ALU_Q-D,CLK.UBCC           ; ARE FORCE ERROR BITS CORRECT.
U 12EF, 0000,013C,0180,0800,0000,1114   ;2628             Z?
U 1114, 0003,003D,0180,09B8,0000,11CC   ;2629   =0        ERROR1,RC[7]_0             ; ID[MAINT] INCORRECT
U 1115, 0800,003C,0180,0A40,0000,12F0   ;2630             D_R[8]
U 12F0, 0000,003C,0180,0A00,0082,12F1   ;2631             SC_R[0]
U 12F1, 0801,0034,0180,09E0,0000,12F2   ;2632             ALU_D.AND.MASK,D_ALU,RC[0C]_ALU
U 12F2, 0018,0038,1980,0800,0200,12F3   ;2633             VA_K[ZERO]                 ; READ LOCATION 0
U 12F3, 0000,003C,0180,0A70,0000,12F4   ;2634             LAB_R[0E]                  ; SET UP UTRAP FLAG
U 12F4, 0000,003C,0180,0AF8,0000,12F5   ;2635             R[0F]_LA
U 12F5, 0000,003C,0180,5000,0000,12F6   ;2636             FS/MCT,MCT/READ.V.WCHK     ; THIS REFERENCE TO LOCATION 0 SHOULD
                                        ;2637                                        ; RESULT IN A CACHE DATA PARITY ERROR.
U 12F6, 0800,003C,0180,0A78,0000,12F7   ;2638             D_R[0F]                    ; SEE IF UTRAP OCCURRED
U 12F7, 0003,003C,0180,0AF8,0000,12F8   ;2639             R[0F]_0
U 12F8, 0001,003C,0180,09C0,0000,12F9   ;2640             RC[8]_D
U 12F9, 0000,003C,01C0,0A70,0000,12FA   ;2641             Q_R[0E]
U 12FA, 001D,2000,0180,0800,0010,12FB   ;2642             ALU_Q-D,CLK.UBCC
U 12FB, 0000,013C,0180,0800,0000,1116   ;2643             Z?
U 1116, 0000,003C,0180,0800,0000,12FC   ;2644   =0        J/DPAR2
U 1117, 0018,0039,0980,09B8,0000,11CC   ;2645             ERROR1,RC[7]_K[.2]         ; NO UTRAP.
U 12FC, 0000,003C,0180,0800,0084,72FD   ;2646   DPAR2:    SC_K[.8]                   ; SEE IF THIS UTRAP WAS BECAUSE OF A CACHE PARITY ER
U 12FD, 0001,0024,0180,0800,0010,12FE   ;2647             ALU_D.ANDNOT.MASK,CLK.UBCC
U 12FE, 0000,013C,0180,0800,0000,1118   ;2648             Z?
U 1118, 0018,0039,0580,09B8,0000,11CC   ;2649   =0        ERROR1,RC[7]_K[.1]         ; UTRAPPED BUT NOT CACHE PARITY ERROR
U 1119, 0000,003C,79F0,2C00,0000,12FF   ;2650             Q_ID[PARITY]               ; GET PARITY ERROR REGISTER
U 12FF, 0001,203C,0180,09D8,0000,1300   ;2651             RC[0B]_Q
U 1300, 0810,0038,0180,0960,0000,1301   ;2652             D_RC[0C]
U 1301, 001D,2000,0180,0800,0010,1302   ;2653             ALU_Q-D,CLK.UBCC           ; SEE IF CORRECT ERROR INDICATION GIVEN
U 1302, 0000,013C,0180,0800,0000,111A   ;2654             Z?
U 111A, 0018,0039,0980,09B8,0000,11CC   ;2655   =0        ERROR1,RC[7]_K[.2]         ; ID[PARITY] INCORRECT
U 111B, 0F03,003C,0180,09D0,0000,1303   ;2656             D_0,RC[0A]_0
U 1303, 0000,003C,7580,3C00,0000,1304   ;2657             ID[MAINT]_D                ; TRY TO CLEAR THE FORCE ERROR BITS.
U 1304, 0000,003C,75F0,2C00,0000,1305   ;2658             Q_ID[MAINT]                ; READ MAINT REGISTER
U 1305, 0001,203C,0180,09C8,0000,1306   ;2659             RC[9]_Q
U 1306, 000D,2024,0180,0A18,0010,1307   ;2660             LAB_R[3],ALU_Q[ANDNOT]LB,CLK.UBCC ; CLEAR?
U 1307, 0000,013C,0180,0800,0000,111C   ;2661             Z?
U 111C, 0003,003D,0180,09B8,0000,11CC   ;2662   =0        ERROR1,RC[7]_0             ; ID[MAINT] INCORRECT
U 111D, 0818,0038,4580,0800,0000,1308   ;2663             D_K[.8000]
U 1308, 0000,003C,7980,3C00,0000,1309   ;2664             ID[PARITY]_D               ; TRY TO CLEAR PARITY ERROR REGISTER.
U 1309, 0600,003C,0180,0800,0000,130A   ;2665             D_D.RIGHT,SI/ZERO
U 130A, 0001,003C,79F0,2DE0,0000,130B   ;2666             RC[0C]_D,Q_ID[PARITY]      : GET PARITY REGISTER
U 130B, 0001,203C,0180,09D8,0000,130C   ;2667             RC[0B]_Q
U 130C, 001D,2000,0180,0800,0010,130D   ;2668             ALU_Q-D,CLK.UBCC                     ; IS IT CLEAR
U 130D, 0000,013C,0180,0800,0000,111E   ;2669             Z?
U 111E, 0018,0039,0580,09B8,0000,11CC   ;2670   =0        ERROR1,RC[7]_K[.1]         ; ID[PARITY] INCORRECT
U 111F, 0000,003C,0180,0A00,0000,130E   ;2671             LAB_R[0]
U 130E, 0018,0014,0580,0A80,0000,130F   ;2672             R[0]_LA+K[.1]              ; GENERATE DATA FOR NEXT TEST
U 130F, 0818,0038,6180,0A00,0000,1310   ;2673             LAB_R[0],D_K[.F]
U 1310, 000D,0008,0180,0800,0010,1311   ;2674             ALU_D[A-B-T]LB,CLK.UBCC
U 1311, 0000,013C,0180,0800,0000,1120   ;2675             Z?
U 1120, 0000,003C,0180,0800,0000,1312   ;2676   =0        J/DPAR3
U 1121, 0018,0038,D580,0A80,0000,1312   ;2677             R[0]_K[.6]
```

```
U 1312, 0800,003C,0180,0A30,0000,1313   ;2678    DPAR3:  D_R[6]
U 1313, 0000,003C,0180,0A38,0000,1314   ;2679            LAB_R[7]
U 1314, 000D,0014,0180,0AB8,0000,1315   ;2680            ALU_D[A+B]LB,R[7]_ALU
U 1315, 0000,003C,0180,0A08,0010,1316   ;2681            ALU_R[1],CLK.UBCC        ; TESTED EACH PARITY CHECKER?
U 1316, 0000,013C,0180,0800,0000,1122   ;2682            Z?
U 1122, 0018,0000,0580,0A88,0000,110B   ;2683    =0      R[1]_LA-K[.1],J/DPAR1    ; IF NOT CONTINUE
U 1123, 0000,003C,0180,0800,0000,1124   ;2684            NOP
```

```
                                                .PAGE   "TEST D9        FORCE MISS BIT AND PARITY ERROR TEST IN GROUP 0"
                                        ;*********************************************************************
                                        ;++
                                        ; TEST  D9      GROUP 0 FORCE MISS BIT AND PARITY DISABLE TEST
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF THE CACHE GROUP ZERO FORCE MISS BIT'S
                                        ;       ABILITY TO DISABLE PARITY ERROR UTRAPS.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                        ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;               FLAG            UTRAP TYPE
                                        ;               ----            ----------
                                        ;               1DE             NO UTRAP OCCURRED
                                        ;               DE              CACHE PARITY UTRAP
                                        ;               15E             TB PARITY ERROR
                                        ;               19E             TB MISS
                                        ;               1CE             TB PROTECTION ERROR
                                        ;               1D6             TB MODIFY BIT ERROR
                                        ;               1DA             X PAGE UTRAP
                                        ;               1DC             UNALIGNED DATA UTRAP
                                        ;
                                        ;--
                                        ;*********************************************************************
                                        =0
U 1124, 0000,003D,0180,0800,0000,11B8   GODP0:  NEWTST
U 1125, 0F18,0038,0580,09F8,0000,1126           D_0,RC[0F]_K[.1]
U 1126, 0000,003D,4980,3C00,0000,1232   =0      ID[TBER0]_D,CALL,J/CAPAT ; TB OFF, AND GET DATA PATTERNS FOR TEST.
U 1127, 0000,003C,0180,0800,0000,1128           NOP
U 1128, 0000,003D,0180,0800,0000,121D   =0      CALL,J/SOFF             ; TURN OFF SBI CYCLES.
U 1129, 0F18,0038,1980,0800,0200,1317           VA_K[ZERO],D_0          ; INVALIDATE LOCATION 0
U 1317, 0000,003C,0180,9000,0000,112A           FS7MCT,MCT/INVALIDATE   ; OF BOTH GROUPS
U 112A, 0F00,003D,0180,0800,0000,11D5   =0      D_0,CALL,J/DC.1DE       ; GENERATE THE UTRAP FLAG DATA
U 112B, 0001,003C,0180,0AF0,0000,1318           R[0E]_D
U 1318, 0003,003C,0180,0AF8,0000,112C           R[0F]_0
U 112C, 0F00,003D,0180,0800,0000,11F4   =0      D_0,CALL,J/DCLA         ; GENERATE AN ADDRESS PATTERN
U 112D, 0000,003C,65F8,0800,0084,7319           SC_K[.10],Q_0
U 1319, 0D00,003C,0180,0800,0000,131A           D_DAL.SC
U 131A, 0200,003C,0180,0800,0000,131B           D_D.RIGHT2,SI/ZERO      ; WITH WHICH A PARITY ERROR
U 131B, 0200,003C,0180,0800,0000,131C           D_D.RIGHT2,SI/ZERO      ; CAN BE FORCED
U 131C, 0001,003C,0180,09A8,0000,112E           RC[5]_D                 ; PATTERN=RC[5]=0AAAA000
U 112E, 0000,003D,0180,0800,0000,1221   =0      CALL,J/ROS              ; SET FORCE REPLACE GROUP 0 BIT
U 112F, 0010,0038,0180,0928,0200,131D           VA_RC[5]                ; VA+05555000
U 131D, 0810,0038,0180,0920,0000,131E           D_RC[4]                 ; DATA=99999999
```

```
U 131E, 0000,003C,0180,9800,0000,1130   ;2740           FS/MCT,MCT/VALIDATE     ; WRITE GROUP 0
U 1130, 0000,003D,0180,0800,0000,1225   ;2741   =0      CALL,J/R1S              ; SET FORCE REPLACE GROUP 1 BIT
U 1131, 0010,0038,0180,0938,0200,131F   ;2742           VA_RC[7]                ; VA=04924000
U 131F, 0810,0038,0180,0930,0000,1320   ;2743           D_RC[6]                 ; DATA=66666666
U 1320, 0000,003C,0180,9800,0000,1132   ;2744           FS/MCT,MCT/VALIDATE     ; WRITE GROUP 1
U 1132, 0F00,003D,0180,0800,0000,11E4   ;2745   =0      D_0,CALL,J/DC9          ; SET FORCE MISS GROUP 0 BIT,
U 1133, 0000,003C,65F8,0800,0084,7321   ;2746           Q_0,SC_K[.10]           ; AND FORCE CACHE ADDRESS PARITY ERROR
U 1321, 0D00,003C,8580,0800,0084,7322   ;2747           D_DAL.SC,SC_K[.C]       ; AT BYTE A OF GROUP 0
U 1322, 0801,001C,0180,0A80,0000,1323   ;2748           A[U_D.ORNOT.MASK,R[0]_ALU,D_ALU ; IN THE MAINT REGISTER
U 1323, 0000,003C,7580,3C00,0000,1324   ;2749           ID[MAINT]_D
U 1324, 0000,003C,0180,0A70,0000,1325   ;2750           LAB_R[0E]               ; SET UP UTRAP FLAG
U 1325, 0000,003C,0180,0AF8,0000,1326   ;2751           R[0F]_LA
U 1326, 0018,0038,1980,0800,0200,1327   ;2752           VA_K[ZERO]
U 1327, 0000,003C,0180,5000,0000,1328   ;2753           FS7MCT,MCT/READ.V.WCHK  ; THIS REFERENCE SHOULD NORMALLY
                                        ;2754                                   ; CAUSE A UTRAP BECAUSE OF A
                                        ;2755                                   ; CACHE PARITY ERROR, BUT
                                        ;2756                                   ; BECAUSE THE FORCE MISS BIT IS SET
                                        ;2757                                   ; NO UTRAP SHOULD OCCUR
U 1328, 0800,003C,0180,0A78,0000,1329   ;2758           D_R[0F]                 ; SEE IF UTRAPPED.
U 1329, 0003,003C,0180,0AF8,0000,132A   ;2759           R[0F]_0
U 132A, 0001,003C,0180,09F0,0000,132B   ;2760           RC[0E]_D
U 132B, 0000,003C,01C0,0A70,0000,132C   ;2761           Q_R[0E]
U 132C, 001D,2000,0180,0800,0010,132D   ;2762           A[U_Q-D,CLK.UBCC
U 132D, 0000,013C,0180,0800,0000,1134   ;2763           Z?
U 1134, 0000,003C,0180,0800,0000,132E   ;2764   =0      J/GODP1                 ; UTRAPPED
U 1135, 0000,003C,0180,0800,0000,1331   ;2765           J/GODP2                 ; NO UTRAP.
U 132E, 0000,003C,0180,0800,0084,732F   ;2766   GODP1:  SC_K[.8]                ; SEE IF UTRAP WAS BECAUSE OF A CACHE PARITY ERROR
U 132F, 0001,0024,0180,0800,0010,1330   ;2767           ALU_D.ANDNOT.MASK,CLK.UBCC
U 1330, 0000,013C,0180,0800,0000,1136   ;2768           Z?
U 1136, 0000,003D,0180,0800,0000,11CC   ;2769   =0      ERROR1                  ; NON CACHE PARITY ERROR UTRAP
U 1137, 0000,003D,0180,0800,0000,11CC   ;2770           ERROR1                  ; CACHE PARITY UTRAP OCCURRED.
U 1331, 0F00,003C,0180,0800,0000,1332   ;2771   GODP2:  D_0                     ; CLEAR MAINT REGISTER
U 1332, 0000,003C,7580,3C00,0000,1138   ;2772           ID[MAINT]_D
```

```
                                           ;2773          .PAGE   "TEST DA       FORCE MISS BIT AND PARITY ERROR TEST IN GROUP 1"
                                           ;2774   ;******************************************************************
                                           ;2775   ;++
                                           ;2776   ; TEST  DA      GROUP 1 FORCE MISS BIT AND PARITY DISABLE TEST
                                           ;2777   ;
                                           ;2778   ; TEST DESCRIPTION
                                           ;2779   ;       THIS IS A TEST OF THE CACHE GROUP ONE FORCE MISS BIT'S
                                           ;2780   ;       ABILITY TO DISABLE PARITY ERROR UTRAPS.
                                           ;2781   ;
                                           ;2782   ; LOGIC DESCRIPTION
                                           ;2783   ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                           ;2784   ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                           ;2785   ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                           ;2786   ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                           ;2787   ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                           ;2788   ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                           ;2789   ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                           ;2790   ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                           ;2791   ;       REGISTER ON THE SBI CONTROL MODULE.
                                           ;2792   ;
                                           ;2793   ; ERROR DESCRIPTION
                                           ;2794   ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                           ;2795   ;               FLAG            UTRAP TYPE
                                           ;2796   ;               ----            ----------
                                           ;2797   ;               1DE             NO UTRAP OCCURRED
                                           ;2798   ;               DE              CACHE PARITY UTRAP
                                           ;2799   ;               15E             TB PARITY ERROR
                                           ;2800   ;               19E             TB MISS
                                           ;2801   ;               1CE             TB PROTECTION ERROR
                                           ;2802   ;               1D6             TB MODIFY BIT ERROR
                                           ;2803   ;               1DA             X PAGE UTRAP
                                           ;2804   ;               1DC             UNALIGNED DATA UTRAP
                                           ;2805   ;
                                           ;2806   ;--
                                           ;2807   ;******************************************************************
                                           ;2808   =0
U 1138, 0000,003D,0180,0800,0000,11B8      ;2809   G1DP0:  NEWTST
U 1139, 0F18,0038,0580,09F8,0000,113A      ;2810           D_0,RC[0F]_K[.1]
U 113A, 0000,003D,4980,3C00,0000,1232      ;2811   =0      ID[TBER0]_D,CALL,J/CAPAT ; TB OFF, AND GET TEST PATTERNS
U 113B, 0000,003C,0180,0800,0000,113C      ;2812           NOP
U 113C, 0000,003D,0180,0800,0000,121D      ;2813   =0      CALL,J/SOFF             ; TURN OFF SBI CYCLES
U 113D, 0F18,0038,1980,0800,0200,1333      ;2814           VA_K[ZERO],D_0          ; INVALIDATE LOCATION 0 IN
U 1333, 0000,003C,0180,9000,0000,113E      ;2815           FS7MCT,MCT/INVALIDATE   ; BOTH GROUPS
U 113E, 0F00,003D,0180,0800,0000,11D5      ;2816   =0      D_0,CALL,J/DC.1DE       : GENERATE A CONSTANT FOR THR UTRAP FLAG
U 113F, 0001,003C,0180,0AF0,0000,1334      ;2817           R[0E]_D
U 1334, 0003,003C,0180,0AF8,0000,1140      ;2818           R[0F]_0
U 1140, 0F00,003D,0180,0800,0000,11F4      ;2819   =0      D_0,CALL,J/DCLA         ; GENERATE AN ADDRESS PATTERN WHICH
U 1141, 0000,003C,65F8,0800,0084,7335      ;2820           SC_K[.10],Q_0           ; WHEN WRITTEN INTO THE
U 1335, 0D00,003C,0180,0800,0000,1336      ;2821           D_DAL.SC                ; CACHE CAN BE USED TO FORCE
U 1336, 0200,003C,0180,0800,0000,1337      ;2822           D_D.RIGHT2,SI/ZERO      ; A CACHE PARITY ERROR.
U 1337, 0200,003C,0180,0800,0000,1338      ;2823           D_D.RIGHT2,SI/ZERO
U 1338, 0001,003C,0180,09B8,0000,1142      ;2824           RC[7]_D                 ; PATTERN=RC[7]=0AAAA000
U 1142, 0000,003D,0180,0800,0000,1221      ;2825   =0      CALL,J/ROS      ; SET THE FORCE REPLACE GROUP 0 BIT
U 1143, 0010,0038,0180,0928,0200,1339      ;2826           VA_RC[5]                ; VA=1B6DB000
U 1339, 0810,0038,0180,0920,0000,133A      ;2827           D_RC[4]                 ; DATA=99999999
```

```
U 133A, 0000,003C,0180,9800,0000,1144   ;2828           FS/MCT,MCT/VALIDATE         ; WRITE GROUP 0
U 1144, 0000,003D,0180,0800,0000,1225   ;2829   =0      CALL,J/R1S                  ; SET FORCE REPLACE GROUP 1 BIT
U 1145, 0010,0038,0180,0938,0200,133B   ;2830           VA_RC[7]                    ; VA=0AAAA000
U 133B, 0810,0038,0180,0930,0000,133C   ;2831           D_RC[6]                     ; DATA=66666666
U 133C, 0000,003C,0180,9800,0000,1146   ;2832           FS/MCT,MCT/VALIDATE         ; WRITE GROUP 1
U 1146, 0F00,003D,0180,0800,0000,11E0   ;2833   =0      D_0,CALL,J/DC5              ; SET FORCE MISS GROUP 0
U 1147, 0000,003C,61F8,0800,0084,733D   ;2834           Q_0,SC_K[.F]                ; AND FORCE PARITY ERROR IN ADDRESS
U 133D, 0D00,003C,8580,0800,0084,733E   ;2835           D_DAL.SC,SC_K[.C]           ; BYTE 0 OF GROUP 1 BITS
U 133E, 0801,001C,0180,0A80,0000,133F   ;2836           ALU_D.ORNOT.MASK,R[0]_ALU,D_ALU ; IN THE MAINT REGISTER
U 133F, 0000,003C,7580,3C00,0000,1340   ;2837           ID[MAINT]_D
U 1340, 0000,003C,0180,0A70,0000,1341   ;2838           LAB_R[0E]                   ; SET UP UTRAP FLAG
U 1341, 0000,003C,0180,0AF8,0000,1342   ;2839           R[0F]_LA
U 1342, 0018,0038,1980,0800,0200,1343   ;2840           VA_K[ZERO]
U 1343, 0000,003C,0180,5000,0000,1344   ;2841           FS7MCT,MCT/READ.V.WCHK      ; THIS REFERENCE WOULD NORMALLY
                                        ;2842                                       ; RESULT IN A UTRAP
                                        ;2843                                       ; BECAUSE OF A CACHE GROUP 1
                                        ;2844                                       ; PARITY ERROR, BUT BECAUSE THE
                                        ;2845                                       ; FORCE MISS BIT FOR GROUP 1 IS
                                        ;2846                                       ; SET NO UTRAP SHOULD OCCUR.
U 1344, 0800,003C,0180,0A78,0000,1345   ;2847           D_R[0F]                     ; SEE IF A UTRAP OCCURRED
U 1345, 0003,003C,0180,0AF8,0000,1346   ;2848           R[0F]_0
U 1346, 0001,003C,0180,09F0,0000,1347   ;2849           RC[0E]_D
U 1347, 0000,003C,01C0,0A70,0000,1348   ;2850           Q_R[0E]
U 1348, 001D,2000,0180,0800,0010,1349   ;2851           ALU_Q-D,CLK.UBCC
U 1349, 0000,013C,0180,0800,0000,1148   ;2852           Z?
U 1148, 0000,003C,0180,0800,0000,134A   ;2853   =0      J/G1DP1                     ; UTRAPPED
U 1149, 0000,003C,0180,0800,0000,134D   ;2854           J/G1DP2                     ; NO UTRAP.
U 134A, 0000,003C,0180,0800,0084,734B   ;2855   G1DP1:  SC_K[.8]                    ; SEE IF THE UTRAP WA
U 134B, 0001,0024,0180,0800,0010,134C   ;2856           ALU_D.ANDNOT.MASK,CLK.UBCC ; BECAUSE OF A CACHE PARITY ERROR
U 134C, 0000,013C,0180,0800,0000,114A   ;2857           Z?
U 114A, 0000,003D,0180,0800,0000,11CC   ;2858   =0      ERROR1                      ; NON CACHE PARITY ERROR UTRAP
U 114B, 0000,003D,0180,0800,0000,11CC   ;2859           ERROR1                      ; CACHE PARITY UTRAP OCCURRED.
U 134D, 0F00,003C,0180,0800,0000,134E   ;2860   G1DP2:  D_0
U 134E, 0000,003C,7580,3C00,0000,114C   ;2861           ID[MAINT]_D
```

```
                                        ;2862        .PAGE   "TEST DB       PA<29> AFFECT ON HIT/MISS COMPARATORS TEST"
                                        ;2863   ;******************************************************************
                                        ;2864   ;++
                                        ;2865   ; TEST  DB      PA<29> AFFECT ON HIT/MISS COMPARATORS TEST
                                        ;2866   ;
                                        ;2867   ; TEST DESCRIPTION
                                        ;2868   ;       THIS IS A TEST OF THE HIT/MISS COMPARATORS' OF
                                        ;2869   ;       BOTH GROUPS REACTION TO AN ADDRESS IN SYSTEM PHYSICAL
                                        ;2870   ;       SPACE (I.E. PA<29>=1).
                                        ;2871   ;
                                        ;2872   ; LOGIC DESCRIPTION
                                        ;2873   ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;2874   ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;2875   ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;2876   ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;2877   ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;2878   ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;2879   ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                        ;2880   ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;2881   ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;2882   ;
                                        ;2883   ; ERROR DESCRIPTION
                                        ;2884   ;       VA REFERENCED
                                        ;2885   ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                        ;2886   ;               ONLY THE HIT/MISS, FORCE MISS AND FORCE REPLACE
                                        ;2887   ;               BITS ARE RELEVANT)
                                        ;2888   ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                        ;2889   ;               UTRAP OCCURS
                                        ;2890   ;       GOT CACHE MAINT REGISTER
                                        ;2891   ;       EXPECTED READ DATA
                                        ;2892   ;       GOT READ DATA
                                        ;2893   ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;2894   ;               FLAG            UTRAP TYPE
                                        ;2895   ;               ----            ----------
                                        ;2896   ;               1DE             NO UTRAP OCCURRED
                                        ;2897   ;               DE              CACHE PARITY UTRAP
                                        ;2898   ;               15E             TB PARITY ERROR
                                        ;2899   ;               19E             TB MISS
                                        ;2900   ;               1CE             TB PROTECTION ERROR
                                        ;2901   ;               1D6             TB MODIFY BIT ERROR
                                        ;2902   ;               1DA             X PAGE UTRAP
                                        ;2903   ;               1DC             UNALIGNED DATA UTRAP
                                        ;2904   ;
                                        ;2905   ;--
                                        ;2906   ;******************************************************************
                                        ;2907   =0
U 114C, 0000,003D,0180,0800,0000,11B8   ;2908   PA29A:  NEWTST
U 114D, 0F18,0038,D580,09F8,0000,114E   ;2909           D_0,RC[0F]_K[.6]
U 114E, 0000,003D,4980,3C00,0000,1232   ;2910   =0      ID[TBER0]_D,CALL,J/CAPAT ; TB OFF, AND GET TEST PATTERNS
U 114F, 0000,003C,0180,0800,0000,1150   ;2911           NOP
U 1150, 0000,003D,0180,0800,0000,121D   ;2912   =0      CALL,J/SOFF              ; TURN OFF SBI CYCLES
U 1151, 0F18,0038,1980,0800,0200,134F   ;2913           VA_K[ZERO],D_0           ; INVALIDATE LOCATION 0 OF
U 134F, 0000,003C,0180,9000,0000,1152   ;2914           FS7MCT,MCT/INVALIDATE    ; BOTH GROUPS
U 1152, 0F00,003D,0180,0800,0000,11D5   ;2915   =0      D_0,CALL,J/DC.1DE        ; GENERATE CONSTANT TO BE USED AS UTRAP FLAG
U 1153, 0001,003C,0180,0AF0,0000,1350   ;2916           R[0E]_D
```

```
U 1350, 0003,003C,0180,0AF8,0000,1156   ;2917          R[0F]_0
U 1156, 0000,003D,0180,0800,0000,1221   ;2918   =0     CALL,J/R0S                 ; SET FORCE REPLACE GROUP 0 BIT
U 1157, 0010,0038,0180,0918,0200,1351   ;2919          VA_RC[3]                   ; VA=06666000
U 1351, 0810,0038,0180,0910,0000,1352   ;2920          D_RC[2]                    ; DATA=55555555
U 1352, 0000,003C,0180,9800,0000,1158   ;2921          FS/MCT,MCT/VALIDATE        ; WRITE GROUP 0
U 1158, 0000,003D,0180,0800,0000,1225   ;2922   =0     CALL,J/R1S                 ; SET FORCE REPLACE GROUP 1 BIT
U 1159, 0010,0038,0180,0908,0200,1353   ;2923          VA_RC[1]                   ; VA=19999000
U 1353, 0810,0038,0180,0900,0000,1354   ;2924          D_RC[0]                    ; DATA=AAAAAAAA
U 1354, 0000,003C,0180,9800,0000,115A   ;2925          FS/MCT,MCT/VALIDATE        ; WRITE GROUP 1
U 115A, 0000,003D,0180,0800,0000,121D   ;2926   =0     CALL,J/SOFF                ; CLEAR FORCE REPLACE BITS
U 115B, 0810,0038,5180,0918,0084,7355   ;2927          D_RC[3],SC_K[.1E]
U 1355, 0001,003C,0580,09F0,0084,B356   ;2928          SC_SC-K[.1],RC[0E]_D
U 1356, 0018,0038,1D80,0A88,0000,1357   ;2929          R[T]_K[SC]
U 1357, 0001,001C,0180,0AA8,0200,1028   ;2930          ALU_D.ORNOT.MASK,VA_ALU,R[5]_ALU ; VA=26666000
U 1028, 0000,003D,0180,0800,0000,1086   ;2931   =00    CALL,J/RMOM1               ; REFERENCE TO 26666000 SHOULD BE A MISS
U 1029, 0000,003D,0180,0800,0000,11CC   ;2932          ERROR1                     ; UNEXPECTED UTRAP OCCURRED
U 102A, 0000,003D,0180,0800,0000,11CC   ;2933          ERROR1                     ; HIT/MISS BITS INCORRECT
U 102B, 0810,0038,0180,0908,0000,1358   ;2934          D_RC[1]
U 1358, 0001,003C,0180,09F0,0000,1359   ;2935          RC[0E]_D
U 1359, 0000,003C,0180,0A08,0082,135A   ;2936          SC_R[1]
U 135A, 0001,001C,0180,0AA8,0200,102C   ;2937          ALU_D.ORNOT.MASK,VA_ALU,R[5]_ALU ; VA=39999000
U 102C, 0000,003D,0180,0800,0000,1086   ;2938   =00    CALL,J/RMOM1               ; REFERENCE TO 39999000 SHOULD BE A MISS
U 102D, 0000,003D,0180,0800,0000,11CC   ;2939          ERROR1                     ; UNEXPECTED UTRAP OCCURRED
U 102E, 0000,003D,0180,0800,0000,11CC   ;2940          ERROR1                     ; HIT/MISS BITS INCORRECT
U 102F, 0810,0038,0180,0918,0200,135B   ;2941          VA_RC[3],D_RC[3]           ; REFERENCE 06666000
U 135B, 0001,003C,0180,09F0,0000,135C   ;2942          RC[0E]_D
U 135C, 0010,0038,01C0,0910,0000,1030   ;2943          Q_RC[2]
U 1030, 0001,203D,0180,09D8,0000,1082   ;2944   =00    CALL,J/RHOM1,RC[0B]_Q      ; SHOULD STILL BE A HIT
U 1031, 0000,003D,0180,0800,0000,11CC   ;2945          ERROR1                     ; UNEXPECTED UTRAP OCCURRED
U 1032, 0000,003D,0180,0800,0000,11CC   ;2946          ERROR1                     ; HIT/MISS BITS INCORRECT
U 1033, 001D,2000,0180,0800,0010,135D   ;2947          ALU_Q-D,CLK.UBCC           ; DATA AT 06666000 SHOULD BE=55555555
U 135D, 0000,013C,0180,0800,0000,115C   ;2948          Z?
U 115C, 0000,003D,0180,0800,0000,11CC   ;2949   =0     ERROR1                     ; DATA INCORRECT
U 115D, 0810,0038,0180,0908,0200,135E   ;2950          VA_RC[1],D_RC[1]           ; REFERENCE 19999000
U 135E, 0001,003C,0180,09F0,0000,135F   ;2951          RC[0E]_D
U 135F, 0010,0038,01C0,0900,0000,1034   ;2952          Q_RC[0]
U 1034, 0001,203D,0180,09D8,0000,1084   ;2953   =00    CALL,J/RMOH1,RC[0B]_Q      ; SHOULD BE A HIT IN GROUP 1
U 1035, 0000,003D,0180,0800,0000,11CC   ;2954          ERROR1                     ; UNEXPECTED UTRAP OCCURRED
U 1036, 0000,003D,0180,0800,0000,11CC   ;2955          ERROR1                     ; HIT/MISS BITS INCORRECT
U 1037, 001D,2000,0180,0800,0010,1360   ;2956          ALU_Q-D,CLK.UBCC           ; DATA AT 19999000 SHOULD BE=AAAAAAAA
U 1360, 0000,013C,0180,0800,0000,115E   ;2957          Z?
U 115E, 0000,003D,0180,0800,0000,11CC   ;2958   =0     ERROR1                     ; DATA INCORRECT
U 115F, 0000,003C,0180,0800,0000,1160   ;2959          NOP
```

```
                                                .PAGE   "TEST DC        STATIC TEST OF GROUP 0'S AND GROUP 1'S DATA MEMORY"
                                        ;***********************************************************************
                                        ;++
                                        ; TEST  DC      STATIC TEST OF GROUP 0'S AND GROUP 1'S DATA MEMORY
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF THE DATA MEMORY IN THE CACHE. A 1 IS FLOATED
                                        ;       THROUGH ZERO'S AND A ZERO IS FLOATED THROUGH ONES IN EACH
                                        ;       LOCATION OF THE DATA MEMORIES.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                        ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       VA REFERENCED
                                        ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                        ;               ONLY THE HIT/MISS, FORCE MISS, AND FORCE REPLACE
                                        ;               BITS ARE RELEVANT)
                                        ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                        ;               UTRAP OCCURS
                                        ;       GOT CACHE MAINT REGISTER
                                        ;       EXPECTED READ DATA
                                        ;       GOT READ DATA
                                        ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;               FLAG            UTRAP TYPE
                                        ;               ----            ----------
                                        ;               1DE             NO UTRAP OCCURRED
                                        ;               DE              CACHE PARITY UTRAP
                                        ;               15E             TB PARITY ERROR
                                        ;               19E             TB MISS
                                        ;               1CE             TB PROTECTION ERROR
                                        ;               1D6             TB MODIFY BIT ERROR
                                        ;               1DA             X PAGE UTRAP
                                        ;               1DC             UNALIGNED DATA UTRAP
                                        ;       0/1, GROUP BEING TESTED
                                        ;--
                                        ;***********************************************************************
                                        =0
U 1160, 0000,003D,0180,0800,0000,11B8   DMEMT:  NEWTST
U 1161, 0F00,003C,0180,0800,0000,1162           D_0
U 1162, 0000,003D,4980,3C00,0000,122E   =0      ID[TBERO]_D,CALL,J/ROM1S ; TB OFF AND SET THE FORCE REPLACE GROUP 0
                                                                        ; FORCE MISS GROUP 1 BITS.
U 1163, 0003,003C,0180,09C0,0000,1361           RC[8]_0                 ; FLAG WHICH INDICATES WHICH
                                                                        ; GROUP IS BEING TESTED.
U 1361, 0018,0038,5D80,09F8,0000,1362           RC[0F]_K[.7]
U 1362, 0003,003C,0180,0A88,0000,1164           R[1]_0
U 1164, 0F00,003D,0180,0800,0000,11D5   =0      D_0,CALL,J/DC.1DE       ; GENERATE CONSTANT FOR UTRAP FLAG
```

```
U 1165, 0001,003C,0180,0AF0,0000,1363   ;3015           R[0E]_D
U 1363, 0818,0038,8180,0800,0000,1364   ;3016   DMEMT1: D_K[.3FF]                ; SET UP THE LOCATION COUNTER
U 1364, 0100,003C,0180,0800,0000,1365   ;3017           D_D.LEFT2,SI/ZERO        ; AND CACHE ADDRESS BEING TESTED.
U 1365, 0001,003C,0180,09F0,0000,1366   ;3018           RC[0E]_D
U 1366, 0018,0038,8D80,0A80,0000,1367   ;3019   DMEMT2: R[0]_K[.1F]              ; COUNTER FOR BIT POSITION
U 1367, 0000,003C,0180,0A08,0010,1368   ;3020           ALU_R[1],CLK.UBCC        ; CODE FOR EXECUTING ERLOOP
U 1368, 0000,013C,0180,0800,0000,1166   ;3021           Z?                       ; ONLY ONCE.
U 1166, 0000,003C,0180,0800,0000,1169   ;3022   =0      J/DMEMT3
U 1167, 0018,0038,C180,0A88,0000,1168   ;3023           R[1]_K[.FFFF]
U 1168, 0000,003D,0180,0800,0000,11CB   ;3024   =0      ERLOOP
U 1169, 0000,003C,0180,0A00,0082,1369   ;3025   DMEMT3: SC_R[0]                  ; GENERATE TEST DATA
U 1369, 0800,0038,0180,09D8,0000,136A   ;3026           ALU_MASK,RC[0B]_ALU,D_ALU ; 0 IN 1'S.
U 136A, 0010,0038,0180,0970,0200,136B   ;3027           VA_RC[0E]                ; SET UP TEST ADDRESS
U 136B, 0000,003C,0180,9800,0000,136C   ;3028           FS7MCT,MCT/VALIDATE      ; WRITE DATA INTO TEST ADDRESS OF
                                        ;3029                                    ; THE GROUP BEING TESTED.
U 136C, 0010,0038,0180,0940,0010,136D   ;3030           ALU_RC[8],CLK.UBCC       ; SEE WHICH GROUP IS BEING TESTED.
U 136D, 0000,013C,0180,0800,0000,116A   ;3031           Z?
U 116A, 0000,003C,0180,0800,0000,1373   ;3032   =0      J/DMEMT4
                                        ;3033   ; TESTING GROUP ZERO:
U 116B, 0F00,003C,0180,0800,0000,1038   ;3034           D_0
U 1038, 0000,003D,0180,0800,0000,1082   ;3035   =00     CALL,J/RHOM1             ; READ TEST ADDRESS AND CHECK FOR GROUP 0 HIT.
U 1039, 0000,003D,0180,0800,0000,11CC   ;3036           ERROR1                   ; UNEXPECTED UTRAP OCCURRED
U 103A, 0000,003D,0180,0800,0000,11CC   ;3037           ERROR1                   ; HIT/MISS BITS INCORRECT.
U 103B, 0010,0038,01C0,0958,0000,136E   ;3038           Q_RC[0B]                         ; CHECK THE DATA
U 136E, 001D,2000,0180,0800,0010,136F   ;3039           ALU_Q-D,CLK.UBCC
U 136F, 0000,013C,0180,0800,0000,116C   ;3040           Z?
U 116C, 0000,003D,0180,0800,0000,11CC   ;3041   =0      ERROR1                   ; DATA INCORRECT.
U 116D, 0010,0038,01C0,0958,0000,1370   ;3042           Q_RC[0B]                         ; NOW TEST 1 IN 0'S
U 1370, 0801,2028,0180,09D8,0000,103C   ;3043           ALU_NOT.Q,D_ALU,RC[0B]_ALU
U 103C, 0000,003D,0180,0800,0000,1216   ;3044   =00     CALL,J/WRITE             ; WRITE GROUP 0
U 103D, 0000,003D,0180,0800,0000,11CC   ;3045           ERROR1                   ; UNEXPECTED UTRAP OCCURRED
U 103E, 0F00,003C,0180,0800,0000,103F   ;3046           D_0
U 103F, 0000,003C,0180,0800,0000,1040   ;3047           NOP
U 1040, 0000,003D,0180,0800,0000,1082   ;3048   =00     CALL,J/RHOM1             ; READ DATA BACK.
U 1041, 0000,003D,0180,0800,0000,11CC   ;3049           ERROR1                   ; UNEXPECTED UTRAP OCCURRED
U 1042, 0000,003D,0180,0800,0000,11CC   ;3050           ERROR1                   ; HIT/MISS BITS INCORRECT.
U 1043, 0010,0038,01C0,0958,0000,1371   ;3051           Q_RC[0B]                         ; CHECK DATA.
U 1371, 001D,2000,0180,0800,0010,1372   ;3052           ALU_Q-D,CLK.UBCC
U 1372, 0000,013C,0180,0800,0000,116E   ;3053           Z?
U 116E, 0000,003D,0180,0800,0000,11CC   ;3054   =0      ERROR1                   ; DATA INCORRECT.
U 116F, 0000,003C,0180,0800,0000,1379   ;3055           J/DMEMT5
                                        ;3056   ; TESTING GROUP ONE.
U 1373, 0F00,003C,0180,0800,0000,1044   ;3057   DMEMT4: D_0
U 1044, 0000,003D,0180,0800,0000,1084   ;3058   =00     CALL,J/RMOH1             ; READ LOCATION BEING TESTED, HIT IN GROUP 1
U 1045, 0000,003D,0180,0800,0000,11CC   ;3059           ERROR1                   ; UNEXPECTED UTRAP OCCURRED
U 1046, 0000,003D,0180,0800,0000,11CC   ;3060           ERROR1                   ; HIT/MISS BITS INCORRECT.
U 1047, 0010,0038,01C0,0958,0000,1374   ;3061           Q_RC[0B]                         ; CHECK THE DATA
U 1374, 001D,2000,0180,0800,0010,1375   ;3062           ALU_Q-D,CLK.UBCC
U 1375, 0000,013C,0180,0800,0000,1170   ;3063           Z?
U 1170, 0000,003D,0180,0800,0000,11CC   ;3064   =0      ERROR1                   ; DATA INCORRECT.
U 1171, 0010,0038,01C0,0958,0000,1376   ;3065           Q_RC[0B]                         ; NOW WRITE THE COMPLEMENT PATTERN
U 1376, 0801,2028,0180,09D8,0000,1048   ;3066           ALU_NOT.Q,D_ALU,RC[0B]_ALU ; 1 IN 0'S
U 1048, 0000,003D,0180,0800,0000,1216   ;3067   =00     CALL,J/WRITE             ; WRITE GROUP 1
U 1049, 0000,003D,0180,0800,0000,11CC   ;3068           ERROR1                   ; UNEXPECTED UTRAP OCCURRED
U 104A, 0F00,003C,0180,0800,0000,104B   ;3069           D_0
```

```
U 104B, 0000,003C,0180,0800,0000,1050   ;3070           NOP
U 1050, 0000,003D,0180,0800,0000,1084   ;3071   =00     CALL,J/RMOH1              ; READ DATA BACK FROM GROUP 1
U 1051, 0000,003D,0180,0800,0000,11CC   ;3072           ERROR1                    ; UNEXPECTED UTRAP OCCURRED
U 1052, 0000,003D,0180,0800,0000,11CC   ;3073           ERROR1                    ; HIT/MISS BITS INCORRECT.
U 1053, 0010,0038,01C0,0958,0000,1377   ;3074           Q_RC[0B]                          ; CHECK THE DATA
U 1377, 001D,2000,0180,0800,0010,1378   ;3075           A[U_Q-D,CLK.UBCC
U 1378, 0000,013C,0180,0800,0000,1172   ;3076           Z?
U 1172, 0000,003D,0180,0800,0000,11CC   ;3077   =0      ERROR1                    ; DATA INCORRECT.
U 1173, 0000,003C,0180,0800,0000,1379   ;3078           NOP
U 1379, 0000,003C,0180,0A00,0010,137A   ;3079   DMEMT5: ALU_R[0],CLK.UBCC         ; SEE IF ALL BITS HAVE BEEN TESTED
U 137A, 0000,013C,0180,0800,0000,1174   ;3080           Z?
U 1174, 0018,0000,0580,0A80,0000,1169   ;3081   =0      R[0]_LA-K[.1],J/DMEMT3    ; IF NOT GO TO NEXT BIT IN THIS LOCATION
                                        ;3082                                     ; OF THE GROUP BEING TESTED.
U 1175, 0810,0038,0180,0970,0010,137B   ;3083           D_RC[0E],CLK.UBCC         ; SEE IF ALL LOCATIONS IN THIS GROUP HAVE BEEN TESTE
U 137B, 0000,013C,0180,0800,0000,1176   ;3084           Z?
U 1176, 0019,0000,1180,09F0,0000,1366   ;3085   =0      ALU_D-K[.4],RC[0E]_ALU,J/DMEMT2 ; IF NOT DECREMENT ADDRESS AND CONTINUE
U 1177, 0010,0038,0180,0940,0010,137C   ;3086           ALU_RC[8],CLK.UBCC        ; SEE IF BOTH GROUPS HAVE BEEN TESTED.
U 137C, 0000,013C,0180,0800,0000,1178   ;3087           Z?
U 1178, 0000,003C,0180,0800,0000,137D   ;3088   =0      J/DMEMT6
U 1179, 0018,0038,0580,09C0,0000,117A   ;3089           RC[8]_K[.1]               ; IF NOT GO BACK AND TEST GROUP 1
U 117A, 0000,003D,0180,0800,0000,1231   ;3090   =0      CALL,J/R1MOS              ; SET THE FORCE REPLACE GROUP 1 BIT AND FORCE MISS
                                        ;3091                                     ; GROUP 0 BIT
U 117B, 0000,003C,0180,0800,0000,1363   ;3092           J/DMEMT1
U 137D, 0000,003C,0180,0800,0000,1180   ;3093   DMEMT6: NOP
```

```
                                        ;3094           .PAGE   "TEST DD        STATIC TEST OF GROUP 0'S ADDRESS MEMORY"
                                        ;3095   ;*********************************************************************
                                        ;3096   ;++
                                        ;3097   ; TEST  DD      STATIC TEST OF GROUP 0'S ADDRESS MEMORY
                                        ;3098   ;
                                        ;3099   ; TEST DESCRIPTION
                                        ;3100   ;       THIS TEST FLOATS A 1 THROUGH 0'S AND A 0 THROUGH 1'S IN
                                        ;3101   ;       EACH LOCATION OF THE CACHE GROUP ZERO'S ADDRESS MEMORY.
                                        ;3102   ;       ADDRESS BITS <28:12> ARE STORED TERE.
                                        ;3103   ;
                                        ;3104   ; LOGIC DESCRIPTION
                                        ;3105   ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;3106   ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;3107   ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;3108   ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;3109   ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;3110   ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;3111   ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                        ;3112   ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;3113   ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;3114   ;
                                        ;3115   ; ERROR DESCRIPTION
                                        ;3116   ;       VA REFERENCED
                                        ;3117   ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                        ;3118   ;               ONLY THE HIT/MISS, FORCE MISS, AND FORCE REPLACE
                                        ;3119   ;               BITS ARE RELEVANT)
                                        ;3120   ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                        ;3121   ;               UTRAP OCCURS
                                        ;3122   ;       GOT CACHE MAINT REGISTER
                                        ;3123   ;       EXPECTED READ DATA
                                        ;3124   ;       GOT READ DATA
                                        ;3125   ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;3126   ;               FLAG            UTRAP TYPE
                                        ;3127   ;               ----            ----------
                                        ;3128   ;               1DE             NO UTRAP OCCURRED
                                        ;3129   ;               DE              CACHE PARITY UTRAP
                                        ;3130   ;               15E             TB PARITY ERROR
                                        ;3131   ;               19E             TB MISS
                                        ;3132   ;               1CE             TB PROTECTION ERROR
                                        ;3133   ;               1D6             TB MODIFY BIT ERROR
                                        ;3134   ;               1DA             X PAGE UTRAP
                                        ;3135   ;               1DC             UNALIGNED DATA UTRAP
                                        ;3136   ;
                                        ;3137   ;--
                                        ;3138   ;*********************************************************************
                                        ;3139   =0
U 1180, 0000,003D,0180,0800,0000,11B8   ;3140   AMTGO:  NEWTST
U 1181, 0F00,003C,0180,0800,0000,1182   ;3141           D_0
U 1182, 0000,003D,4980,3C00,0000,121D   ;3142   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 1183, 0818,0038,8180,0800,0000,137E   ;3143           D_K[.3FF]               ; GENERATE SOME COUNTER AND ADDRESS VALUES
U 137E, 0100,003C,0180,0800,0000,137F   ;3144           D_D.LEFT2,SI/ZERO
U 137F, 0001,003C,0180,0AB8,0000,1184   ;3145           R[7]_D
U 1184, 0F00,003D,0180,0800,0000,11D5   ;3146   =0      D_0,CALL,J/DC.1DE       ; INITIALIZE UTRAP FLAG
U 1185, 0001,003C,0180,0AF0,0000,1380   ;3147           R[0E]_D
U 1380, 0003,003C,0180,0AF8,0000,1381   ;3148           R[0F]_0
```

```
U 1381, 0018,0038,D580,09F8,0000,1186    ;3149            RC[0F]_K[.6]
                                         ;3150    =0
U 1186, 0F00,003C,0180,0A38,0200,1187    ;3151    AMTGOA: VA_R[7],D_0               ; INVALIDATE EVERY LOCATION IN BOTH
U 1187, 0000,003C,0180,9000,0000,1382    ;3152            FS7MCT,MCT/INVALIDATE     ; CACHE GROUPS
U 1382, 0000,003C,0180,0A38,0010,1383    ;3153            ALU_R[7],CLK.UBCC
U 1383, 0000,013C,0180,0800,0000,1188    ;3154            Z?
U 1188, 0018,0000,0580,0AB8,0000,1186    ;3155    =0      R[7]_LA-K[.1],J/AMTGOA
U 1189, 0018,0038,49C0,0800,0000,1384    ;3156            Q_K[.FF]
U 1384, 0000,003C,03A8,0800,0000,118A    ;3157            Q_Q.LEFT,SI/7             ; GENERATE A COUNTER R[0]=1FE
U 118A, 0001,203D,0180,0A80,0000,122E    ;3158    =0      R[0]_Q,CALL,J/ROM1S       ; SET FORCE GROUP 1 MISSES AND REPLACE GROUP 0 BITS.
U 118B, 0003,003C,0180,0A88,0000,1385    ;3159            R[1]_0
U 1385, 0000,003C,8580,0800,0084,7386    ;3160            SC_K[.C]                  ; GENERATE AN ADDRESS MASK
U 1386, 0803,0010,6580,0800,0084,9387    ;3161            ALU_MASK+1,D_ALU.SC_SC+K[.10]
U 1387, 0000,003C,0580,0800,0084,9388    ;3162            SC_SC+K[.1]               ; SC=29.
U 1388, 0003,0010,01C0,0800,0000,1389    ;3163            ALU_MASK+1,Q_ALU
U 1389, 001D,0024,0180,0AA8,0000,138A    ;3164            ALU_D[ANDNOT]Q,R[5]_ALU   ; R[5]=1FFFF000
U 138A, 0003,003C,0180,0AD0,0000,138B    ;3165            R[0A]_0
U 138B, 0018,0038,6580,0A90,0000,138C    ;3166    AMTGOB: R[2]_K[.10]               ; GENERATE COUNTER FOR TAG BITS
U 138C, 0000,003C,0180,0A50,0010,138D    ;3167            ALU_R[0A],CLK.UBCC        ; CODE SO THAT ERLOOP IS EXECUTED ONLY ONCE
U 138D, 0000,013C,0180,0800,0000,118C    ;3168            Z?
U 118C, 0000,003C,0180,0800,0000,118F    ;3169    =0      J/AMTGOC
U 118D, 0018,0038,C180,0AD0,0000,118E    ;3170            R[0A]_K[.FFFF]
U 118E, 0000,003D,0180,0800,0000,11CB    ;3171    =0      ERLOOP
U 118F, 0800,003C,0180,0A10,0000,138E    ;3172    AMTGOC: D_R[2]                    ; GENERATE 1IN 0'S TEST ADDRESS PATTERN
U 138E, 0019,0014,8580,0A98,0082,138F    ;3173            ALU_D+K[.C],SC_ALU,R[3]_ALU
U 138F, 0001,003C,0180,09D8,0000,1390    ;3174            RC[0B]_D
U 1390, 0800,003C,0180,0A08,0000,1391    ;3175            D_R[1]
U 1391, 0001,001C,0180,09F0,0200,1392    ;3176            ALU_D.ORNOT.MASK,VA_ALU,RC[0E]_ALU
U 1392, 0810,0038,0180,0958,0000,1393    ;3177            D_RC[0B]                  ; DATA=COUNTER FOR TAG BITS
U 1393, 0000,003C,0180,9800,0000,1054    ;3178            FS/MCT,MCT/VALIDATE       ; WRITE GROUP 0
U 1054, 0000,003D,0180,0800,0000,1082    ;3179    =00     CALL,J/RHOM1              ; READ HIT IN GROUP 0
U 1055, 0000,003D,0180,0800,0000,11CC    ;3180            ERROR1                    ; UNEXPECTED UTRAP OCCURRED
U 1056, 0000,003D,0180,0800,0000,11CC    ;3181            ERROR1                    ; HIT/MISS BITS INCORRECT
U 1057, 0010,0038,01C0,0958,0000,1394    ;3182            Q_RC[0B]                  ; CHECK THE DATA READ
U 1394, 001D,2000,0180,0800,0010,1395    ;3183            ALU_Q-D,CLK.UBCC
U 1395, 0000,013C,0180,0800,0000,1190    ;3184            Z?
U 1190, 0000,003D,0180,0800,0000,11CC    ;3185    =0      ERROR1                    ; DATA INCORRECT
U 1191, 0000,003C,0180,0A18,0082,1396    ;3186            SC_R[3]                   ; GENERATE 0 IN 1'S TEST ADDRESS PATTERN
U 1396, 0800,003C,0180,0A10,0000,1397    ;3187            D_R[2]
U 1397, 0001,0028,0180,09D8,0000,1398    ;3188            ALU_NOT.D,RC[0B]_ALU
U 1398, 0000,0034,01C0,0A28,0000,1399    ;3189            ALU_R[5].AND.MASK,Q_ALU
U 1399, 001C,0030,01C0,0A08,0200,139A    ;3190            LAB_R[1],ALU_LA[OR]Q,VA_ALU,Q_ALU
U 139A, 0001,203C,0180,09F0,0000,139B    ;3191            RC[0E]_Q
U 139B, 0810,0038,0180,0958,0000,139C    ;3192            D_RC[0B]
U 139C, 0000,003C,0180,9800,0000,1060    ;3193            FS/MCT,MCT/VALIDATE       ; WRITE GROUP 0
U 1060, 0000,003D,0180,0800,0000,1082    ;3194    =00     CALL,J/RHOM1              ; CHECK GROUP 0 HIT
U 1061, 0000,003D,0180,0800,0000,11CC    ;3195            ERROR1                    ; UNEXPECTED UTRAP OCCURRED
U 1062, 0000,003D,0180,0800,0000,11CC    ;3196            ERROR1                    ; HIT/MISS BITS INCORRECT
U 1063, 0010,0038,01C0,0958,0000,139D    ;3197            Q_RC[0B]                  ; CHECK DATA READ
U 139D, 001D,2000,0180,0800,0010,139E    ;3198            ALU_Q-D,CLK.UBCC
U 139E, 0000,013C,0180,0800,0000,1192    ;3199            Z?
U 1192, 0000,003D,0180,0800,0000,11CC    ;3200    =0      ERROR1                    ; DATA INCORRECT
U 1193, 0000,003C,0180,0A10,0010,139F    ;3201            ALU_R[2],CLK.UBCC         ; TESTED ALL BITS IN THIS LOACTION?
U 139F, 0000,013C,0180,0800,0000,1194    ;3202            Z?
U 1194, 0018,0000,0580,0A90,0000,118F    ;3203    =0      R[2]_LA-K[.1],J/AMTGOC    ; IF NOT CONTINUE TESTING THIS LOCATION
```

```
U 1195, 0800,003C,0180,0A08,0000,13A0   ;3204            D_R[1]                  ; INCREMENT THE ADDRESS
U 13A0, 0019,0014,0180,0A88,0000,13A1   ;3205            A[U_D+K[.8],R[1]_ALU
U 13A1, 0000,003C,0180,0A00,0010,13A2   ;3206            ALU_R[0],CLK.UBCC       ; TESTED ALL LOCATION?
U 13A2, 0000,013C,0180,0800,0000,1196   ;3207            Z?
U 1196, 0018,0000,0580,0A80,0000,138B   ;3208    =0      R[0]_LA-K[.1],J/AMTGOB  ; IF NOT GO TEST NEXT LOCATION
U 1197, 0000,003C,0180,0800,0000,1198   ;3209            NOP
```

```
                                                .PAGE   "TEST DE        STATIC TEST OF GROUP 1'S ADDRESS MEMORY"
                                        ;**********************************************************************
                                        ;++
                                        ; TEST  DE      STATIC TEST OF GROUP 1'S ADDRESS MEMORY
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST FLOATS A 1 THROUGH 0'S AND A 0 THROUGH 1'S IN
                                        ;       EACH LOCATION OF THE CACHE GROUP ONE'S ADDRESS MEMORY.
                                        ;       ADDRESS BITS <28:12> ARE STORED TERE.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                        ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       VA REFERENCED
                                        ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                        ;               ONLY THE HIT/MISS, FORCE MISS, AND FORCE REPLACE
                                        ;               BITS ARE RELEVANT)
                                        ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                        ;               UTRAP OCCURS
                                        ;       GOT CACHE MAINT REGISTER
                                        ;       EXPECTED READ DATA
                                        ;       GOT READ DATA
                                        ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;               FLAG            UTRAP TYPE
                                        ;               ----            ----------
                                        ;               1DE             NO UTRAP OCCURRED
                                        ;               DE              CACHE PARITY UTRAP
                                        ;               15E             TB PARITY ERROR
                                        ;               19E             TB MISS
                                        ;               1CE             TB PROTECTION ERROR
                                        ;               1D6             TB MODIFY BIT ERROR
                                        ;               1DA             X PAGE UTRAP
                                        ;               1DC             UNALIGNED DATA UTRAP
                                        ;
                                        ;--
                                        ;**********************************************************************
                                        =0
U 1198, 0000,003D,0180,0800,0000,11B8   AMTG1:  NEWTST
U 1199, 0F00,003C,0180,0800,0000,119A           D_0
U 119A, 0000,003D,4980,3C00,0000,121D   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 119B, 0818,0038,8180,0800,0000,13A3           D_K[.3FF]               ; INITIALIZE SOME COUNTERS
U 13A3, 0100,003C,0180,0800,0000,13A4           D_D.LEFT2,SI/ZERO
U 13A4, 0001,003C,0180,0AB8,0000,119C           R[7]_D
U 119C, 0F00,003D,0180,0800,0000,11D5   =0      D_0,CALL,J/DC.1DE       ; SET UP UTRAP FLAG
U 119D, 0001,003C,0180,0AF0,0000,13A5           R[0E]_D
U 13A5, 0003,003C,0180,0AF8,0000,13A6           R[0F]_0
```

```
U 13A6, 0018,0038,D580,09F8,0000,119E   ;3265           RC[0F]_K[.6]
                                        ;3266   =0
U 119E, 0F00,003C,0180,0A38,0200,119F   ;3267   AMTG1A: VA_R[7],D_0              ; INVALIDATE EVERY LOCATION OF EACH GROUP
U 119F, 0000,003C,0180,9000,0000,13A7   ;3268           FS7MCT,MCT/INVALIDATE
U 13A7, 0000,003C,0180,0A38,0010,13A8   ;3269           ALU_R[7],CLK.UBCC
U 13A8, 0000,013C,0180,0800,0000,11A0   ;3270           Z?
U 11A0, 0018,0000,0580,0AB8,0000,119E   ;3271   =0      R[7]_LA-K[.1],J/AMTG1A
U 11A1, 0018,0038,49C0,0800,0000,13A9   ;3272           Q_K[.FF]
U 13A9, 0000,003C,03A8,0800,0000,11A2   ;3273           Q_Q.LEFT,SI/7
U 11A2, 0001,203D,0180,0A80,0000,1231   ;3274   =0      R[0]_Q,CALL,J/R1MOS      ; SET FORCE REPLACE GROUP 1 FORCE MISSES TO GROUP 0
U 11A3, 0003,003C,0180,0A88,0000,13AA   ;3275           R[1]_0
U 13AA, 0000,003C,8580,0800,0084,73AB   ;3276           SC_K[.C]                 ; GENERATE A MASK FOR THE TAG
U 13AB, 0803,0010,6580,0800,0084,93AC   ;3277           ALU_MASK+1,D_ALU,SC_SC+K[.10]
U 13AC, 0000,003C,0580,0800,0084,93AD   ;3278           SC_SC+K[.1]              ; SC=29.
U 13AD, 0003,0010,01C0,0800,0000,13AE   ;3279           ALU_MASK+1,Q_ALU
U 13AE, 001D,0024,0180,0AA8,0000,13AF   ;3280           ALU_D[ANDNOT]Q,R[5]_ALU  ; R[5]=1FFFF000
U 13AF, 0003,003C,0180,0AD0,0000,13B0   ;3281           R[0A]_0
U 13B0, 0018,0038,6580,0A90,0000,13B1   ;3282   AMTG1B: R[2]_K[.10]              ; INITIALIZE THE TAG BIT COUNTER
U 13B1, 0000,003C,0180,0A50,0010,13B2   ;3283           ALU_R[0A],CLK.UBCC       ; CODE FOR E'.ECUTING ERLOOP ONLY ONCE
U 13B2, 0000,013C,0180,0800,0000,11A4   ;3284           Z?
U 11A4, 0000,003C,0180,0800,0000,11A7   ;3285   =0      J/AMTG1C
U 11A5, 0018,0038,C180,0AD0,0000,11A6   ;3286           R[0A]_K[.FFFF]
U 11A6, 0000,003D,0180,0800,0000,11CB   ;3287   =0      ERLOOP
U 11A7, 0800,003C,0180,0A10,0000,13B3   ;3288   AMTG1C: D_R[2]                   ; GENERATE 1 IN 0'S ADDRESS TEST PATTERN
U 13B3, 0019,0014,8580,0A98,0082,13B4   ;3289           A[U_D+K[.C],SC_ALU,R[3]_ALU
U 13B4, 0001,003C,0180,09D8,0000,13B5   ;3290           RC[0B]_D
U 13B5, 0800,003C,0180,0A08,0000,13B6   ;3291           D_R[1]
U 13B6, 0001,001C,0180,09F0,0200,13B7   ;3292           A[U_D.ORNOT.MASK,VA_ALU,RC[0E]_ALU
U 13B7, 0810,0038,0180,0958,0000,13B8   ;3293           D_RC[0B]
U 13B8, 0000,003C,0180,9800,0000,1064   ;3294           FS/MCT,MCT/VALIDATE      ; WRITE GROUP 1
U 1064, 0000,003D,0180,0800,0000,1084   ;3295   =00     CALL,J/RMOH1             ; READ GROUP 1 HIT
U 1065, 0000,003D,0180,0800,0000,11CC   ;3296           ERROR1                   ; UNEXPECTED UTRAP OCCURRED
U 1066, 0000,003D,0180,0800,0000,11CC   ;3297           ERROR1                   ; HIT/MISS BITS INCORRECT
U 1067, 0010,0038,01C0,0958,0000,13B9   ;3298           Q_RC[0B]                 ; CHECK GROUP 1 DATA
U 13B9, 001D,2000,0180,0800,0010,13BA   ;3299           A[U_Q-D,CLK.UBCC
U 13BA, 0000,013C,0180,0800,0000,11A8   ;3300           Z?
U 11A8, 0000,003D,0180,0800,0000,11CC   ;3301   =0      ERROR1                   ; DATA INCORRECT
U 11A9, 0000,003C,0180,0A18,0082,13BB   ;3302           SC_R[3]                  ; GENERATE 0 IN 1'S ADDRESS PATTERN
U 13BB, 0800,003C,0180,0A10,0000,13BC   ;3303           D_R[2]
U 13BC, 0001,0028,0180,09D8,0000,13BD   ;3304           A[U_NOT.D,RC[0B]_ALU
U 13BD, 0000,0034,01C0,0A28,0000,13BE   ;3305           ALU_R[5].AND.MASK,Q_ALU
U 13BE, 001C,0030,01C0,0A08,0200,13BF   ;3306           LAB_R[1],ALU_LA[OR]Q,VA_ALU,Q_ALU
U 13BF, 0001,203C,0180,09F0,0000,13C0   ;3307           RC[0E]_Q
U 13C0, 0810,0038,0180,0958,0000,13C1   ;3308           D_RC[0B]
U 13C1, 0000,003C,0180,9800,0000,1068   ;3309           FS/MCT,MCT/VALIDATE      ; WRITE GROUP 1
U 1068, 0000,003D,0180,0800,0000,1084   ;3310   =00     CALL,J/RMOH1             ; READ GROUP 1 HIT
U 1069, 0000,003D,0180,0800,0000,11CC   ;3311           ERROR1                   ; UNEXPECTED UTRAP OCCURRED
U 106A, 0000,003D,0180,0800,0000,11CC   ;3312           ERROR1                   ; HIT/MISS BITS INCORRECT
U 106B, 0010,0038,01C0,0958,0000,13C2   ;3313           Q_RC[0B]                 ; CHECK DATA
U 13C2, 001D,2000,0180,0800,0010,13C3   ;3314           A[U_Q-D,CLK.UBCC
U 13C3, 0000,013C,0180,0800,0000,11AA   ;3315           Z?
U 11AA, 0000,003D,0180,0800,0000,11CC   ;3316   =0      ERROR1                   ; DATA INCORRECT
U 11AB, 0000,003C,0180,0A10,0010,13C4   ;3317           ALU_R[2],CLK.UBCC        ; TESTED ALL BITS IN THIS TAG LOCATION?
U 13C4, 0000,013C,0180,0800,0000,11AC   ;3318           Z?
U 11AC, 0018,0000,0580,0A90,0000,11A7   ;3319   =0      R[2]_LA-K[.1],J/AMTG1C   ; IF NOT CONTINUE
```

```
U 11AD, 0800,003C,0180,0A08,0000,13C5   ;3320           D_R[1]
U 13C5, 0019,0014,0180,0A88,0000,13C6   ;3321           A[U_D+K[.8],R[1]_ALU    ; INCREMENT ADDRESS
U 13C6, 0000,003C,0180,0A00,0010,13C7   ;3322           ALU_R[0],CLK.UBCC       ; TESTED ALL LOCATIONS?
U 13C7, 0000,013C,0180,0800,0000,11AE   ;3323           Z?
U 11AE, 0018,0000,0580,0A80,0000,13B0   ;3324   =0      R[0]_LA-K[.1],J/AMTG1B  ; IF NOT TEST NEXT LOCATION
U 11AF, 0000,003C,0180,0800,0000,13C8   ;3325           NOP
U 13C8, 0000,003D,0180,0800,0000,11B8   ;3326   DUM1:   NEWTST
```

```
;                               Location / Line Number Index

;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 0000 - 0FFF Unused
U 1000          1871:   1838    1845=   1861=   2257=   2258=   2259=   2260=
U 1008          2262=   2263=   2264=   2265=   2277=   2278=   2279=   2280=
U 1010          2283=   2284=   2285=   2286=   2298=   2299=   2300=   2301=
U 1018          2304=   2305=   2306=   2307=   2319=   2320=   2321=   2322=
U 1020          2325=   2326=   2327=   2328=   2339=   2340=   2341=   2342=
U 1028          2931=   2932=   2933=   2934=   2938=   2939=   2940=   2941=
U 1030          2944=   2945=   2946=   2947=   2953=   2954=   2955=   2956=
U 1038          3035=   3036=   3037=   3038=   3044=   3045=   3046=   3047=
U 1040          3048=   3049=   3050=   3051=   3058=   3059=   3060=   3061=
U 1048          3067=   3068=   3069=   3070=   1862=   1863=   1902:   1839
U 1050          3071=   3072=   3073=   3074=   3179=   3180=   3181=   3182=
U 1058          1952=   1953=   1905:   1840    1954=   1955=   1908:   1841
U 1060          3194=   3195=   3196=   3197=   3295=   3296=   3297=   3298=
U 1068          3310=   3311=   3312=   3313=   1980=   1981=   1983=   1984=
U 1070          1986=   1987=   1990=   1991=   1993=   1994=   1996=   1997=
U 1078          2000=   2001=   2004=   2005=   2022=   2023=   2025=   2026=
U 1080          2035=   2036=   2038=   2039=   2041=   2042=   2044=   2045=
U 1088          2065=   2066=   2074=   2075=   2088=   2089=   2136=   2137=
U 1090          2139=   2140=   2144=   2145=   2147=   2148=   2159=   2160=
U 1098          2161=   2162=   2163=   2164=   2219=   2220=   2221=   2222=
U 10A0          2224=   2225=   2227=   2228=   2231=   2232=   2235=   2236=
U 10A8          2242=   2243=   2250=   2251=   2254=   2255=   2267=   2268=
U 10B0          2269=   2270=   2274=   2275=   2288=   2289=   2290=   2291=
U 10B8          2295=   2296=   2309=   2310=   2311=   2312=   2316=   2317=
U 10C0          2330=   2331=   2334=   2335=   2344=   2345=   2396=   2397=
U 10C8          2398=   2399=   2400=   2401=   2403=   2404=   2410=   2411=
U 10D0          2416=   2417=   2422=   2423=   2426=   2427=   2435=   2436=
U 10D8          2442=   2443=   2450=   2451=   2459=   2460=   2474=   2475=
U 10E0          2479=   2480=   2485=   2486=   2492=   2493=   2500=   2501=
U 10E8          2503=   2504=   2511=   2512=   2563=   2564=   2565=   2566=
U 10F0          2567=   2568=   2570=   2571=   2575=   2576=   2577=   2578=
U 10F8          2580=   2581=   2586=   2587=   2592=   2593=   2596=   2597=
U 1100          1825:   1826:   1827:   1828:   1829:   1830:   1831:   1832:
U 1108          1833:   1842    2605=   2606=   1834:   1835:   1836:   1837:
U 1110          2612=   2613=   2620=   2621=   2629=   2630=   2644=   2645=
U 1118          2649=   2650=   2655=   2656=   2662=   2663=   2670=   2671=
U 1120          2676=   2677=   2683=   2684=   2721=   2722=   2723=   2724=
U 1128          2725=   2726=   2728=   2729=   2731=   2732=   2737=   2738=
U 1130          2741=   2742=   2745=   2746=   2764=   2765=   2769=   2770=
U 1138          2809=   2810=   2811=   2812=   2813=   2814=   2816=   2817=
U 1140          2819=   2820=   2825=   2826=   2829=   2830=   2833=   2834=
U 1148          2853=   2854=   2858=   2859=   2908=   2909=   2910=   2911=
U 1150          2912=   2913=   2915=   2916=   1843    1928:   2918=   2919=
U 1158          2922=   2923=   2926=   2927=   2949=   2950=   2958=   2959=
U 1160          3006=   3007=   3008=   3010=   3014=   3015=   3022=   3023=
U 1168          3024=   3025=   3032=   3034=   3041=   3042=   3054=   3055=
U 1170          3064=   3065=   3077=   3078=   3081=   3083=   3085=   3086=
U 1178          3088=   3089=   3090=   3092=   2011:   2012:   2013:   2014:
U 1180          3140=   3141=   3142=   3143=   3146=   3147=   3151=   3152=
U 1188          3155=   3156=   3158=   3159=   3169=   3170=   3171=   3172=
U 1190          3185=   3186=   3200=   3201=   3203=   3204=   3208=   3209=
U 1198          3256=   3257=   3258=   3259=   3262=   3263=   3267=   3268=
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0          3271=   3272=   3274=   3275=   3285=   3286=   3287=   3288=
U 11A8          3301=   3302=   3316=   3317=   3319=   3320=   3324=   3325=
U 11B0          1844    1864    1865    1866    1867    1868    1869    1870
U 11B8          1880    1881    1882    1883    1884    1885    1886    1887
U 11C0          1888    1889    1890    1891    1892    1893    1894    1895
U 11C8          1896    1897    1898    1899    1900    1901    1903    1904
U 11D0          1936    1937    1943    1944    1945    1950    1951    1957
U 11D8          1958    1959    1960    1961    1962    1963    1964    1965
U 11E0          1966    1967    1968    1969    1970    1971    1972    1973
U 11E8          1974    1975    1976    1977    1978    1982    1988    1992
U 11F0          1998    2002    2006    2010    2020    2024    2046    2047
U 11F8          2048    2049    2050    2051    2015:   2016:   2017:   2018:
U 1200          2052    2053    2054    2055    2056    2057    2058    2059
U 1208          2060    2061    2062    2063    2064    2067    2068    2069
U 1210          2070    2071    2072    2073    2076    2077    2081    2082
U 1218          2083    2084    2085    2086    2087    2095    2096    2097
U 1220          2098    2100    2101    2102    2103    2105    2106    2108
U 1228          2109    2111    2112    2114    2115    2116    2118    2119
U 1230          2120    2122    2134    2138    2141    2142    2146    2149
U 1238          2150    2151    2152    2153    2154    2155    2156    2157
U 1240          2158    2165    2166    2167    2168    2169    2170    2171
U 1248          2172    2173    2223    2226    2229    2230    2233    2234
U 1250          2237    2238    2239    2240    2241    2244    2245    2246
U 1258          2247    2248    2249    2252    2253    2256    2261    2266
U 1260          2271    2272    2273    2281    2282    2287    2292    2293
U 1268          2294    2297    2302    2303    2308    2313    2314    2315
U 1270          2318    2323    2324    2329    2332    2333    2336    2337
U 1278          2338    2343    2402    2405    2406    2407    2408    2409
U 1280          2412    2413    2414    2415    2418    2419    2420    2421
U 1288          2424    2425    2428    2429    2430    2431    2432    2433
U 1290          2434    2437    2438    2439    2440    2441    2444    2445
U 1298          2446    2447    2448    2449    2452    2453    2454    2455
U 12A0          2456    2457    2458    2461    2462    2463    2464    2465
U 12A8          2466    2468    1929:   2469    2470    2471    2472    2473
U 12B0          2476    2477    2478    2481    2482    2483    2484    2487
U 12B8          2488    2489    2490    2491    2494    2495    2496    2497
U 12C0          2498    2499    2502    2505    2506    2507    2508    2509
U 12C8          2510    2569    2572    2573    2579    2582    2583    2584
U 12D0          2585    2588    2589    2590    2591    2594    2595    2598
U 12D8          2599    2600    2601    2602    2603    2604    2607    2608
U 12E0          2609    2610    2611    2614    2615    2616    2617    2618
U 12E8          2619    2622    2623    2624    2625    2626    2627    2628
U 12F0          2631    2632    2633    2634    2635    2636    2638    2639
U 12F8          2640    2641    2642    2643    2646    2647    2648    2651
U 1300          2652    2653    2654    2657    2658    2659    2660    2661
U 1308          2664    2665    2666    2667    2668    2669    2672    2673
U 1310          2674    2675    2678    2679    2680    2681    2682    2727
U 1318          2730    2733    2734    2735    2736    2739    2740    2743
U 1320          2744    2747    2748    2749    2750    2751    2752    2753
U 1328          2758    2759    2760    2761    2762    2763    2766    2767
U 1330          2768    2771    2772    2815    2818    2821    2822    2823
U 1338          2824    2827    2828    2831    2832    2835    2836    2837
U 1340          2838    2839    2840    2841    2847    2848    2849    2850
```

```
;Location         0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348            2851    2852    2855    2856    2857    2860    2861    2914
U 1350            2917    2920    2921    2924    2925    2928    2929    2930
U 1358            2935    2936    2937    2942    2943    2948    2951    2952
U 1360            2957    3012    3013    3016    3017    3018    3019    3020
U 1368            3021    3026    3027    3028    3030    3031    3039    3040
U 1370            3043    3052    3053    3057    3062    3063    3066    3075
U 1378            3076    3079    3080    3084    3087    3093    3144    3145
U 1380            3148    3149    3153    3154    3157    3160    3161    3162
U 1388            3163    3164    3165    3166    3167    3168    3173    3174
U 1390            3175    3176    3177    3178    3183    3184    3187    3188
U 1398            3189    3190    3191    3192    3193    3198    3199    3202
U 13A0            3205    3206    3207    3260    3261    3264    3265    3269
U 13A8            3270    3273    3276    3277    3278    3279    3280    3281
U 13B0            3282    3283    3284    3289    3290    3291    3292    3293
U 13B8            3294    3299    3300    3303    3304    3305    3306    3307
U 13C0            3308    3309    3314    3315    3318    3321    3322    3323
U 13C8            3326
U 13D0 - 13EF Unused
U 13F0            1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8            1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
          Words not
          in bounds
 ESK00DEF         0
 ESK00MAC         0
 ESKAHMAC         0
  ESKAH2E       985

Used            985
Remaining

Total microwords used in memory U: 985
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH2E.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

; 3 Control ROM Field Definitions
; 548 Register Transfer Macro Definitions
; 1413 Non-transfer Functions
; 1485 Branch Enable Macro Definitions
; 1564 MICRO DIAGNOSTIC DEFINED MACROS
; 1806 MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2211 TEST DF DUAL ADDRESSING TEST OF CACHE TAG STORE
; 2363 TEST E0 DUAL ADDRESSING TEST OF CACHE VALID BIT
; 2488 TEST E1 DUAL ADDRESSING TEST OF CACHE DATA MATRIX
; 2614 TEST E2 CACHE PARITY MICRO TRAP ENABLE VS MCT FUNCTION
; 2751 TEST E3 MOVING INVERSIONS TEST OF GROUP 0'S DATA MEMORY
; 2896 TEST E4 MOVING INVERSIONS TEST OF GROUP 1'S DATA MEMORY

```
;1      .NOLIST
;1804   .LIST
;1805
```

```
                                             .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                         .REGION/1000,13FF
                                         ;+
                                         ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                         ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                         ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                         ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                         ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                         ;
                                         ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                         ;        6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                         ;        ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                         ;        R[OF] AND DO A RETURNO.
                                         ;
                                         ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                         ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                         ; TO THE CONSOLE.
                                         ;
                                         ;
                                         ;-
U 1100, 0000,003C,1980,0800,0084,7003    1100:   SC_K[ZERO],J/TRPH1       ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001    1101:   SC_K[.1],J/TRPH0         ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001    1102:   SC_K[.2],J/TRPH0         ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001    1103:   SC_K[.3],J/TRPH0         ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001    1104:   SC_K[.4],J/TRPH0         ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001    1105:   SC_K[.6],J/TRPH0         ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001    1106:   SC_K[.9],J/TRPH0         ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001    1107:   SC_K[.7],J/TRPH0         ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001    1108:   SC_K[.8],J/TRPH0         ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003    110C:   SC_K[.C],J/TRPH1         ; RDS
U 110D, 0000,003C,8980,0800,0084,7003    110D:   SC_K[.D],J/TRPH1         ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001    110E:   SC_K[.10],J/TRPH0        ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003    110F:   SC_K[.F],J/TRPH1         ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,1006    TRPH0:  Q_ID[USTACK]
U 1006, 0C00,003C,01E0,0800,0000,100E            Q_D,D_Q
U 100E, 0000,003C,8180,3C00,0000,1013            ID[USTACK]_D
U 1013, 0C00,003C,01E0,0800,0000,1016            Q_D,D_Q
U 1016, 0000,003C,01C0,0A78,0000,101E            Q_R[OF]
U 101E, 0001,2024,0180,0800,0010,103F            ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 103F, 0000,013C,0180,0800,0000,1002            Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000    =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
                                         ;+
                                         ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                         ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                         ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                         ;
                                         ;        DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                         ;              TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                         ;              FAULT STATUS REGISTER
                                         ;              SBI ERROR REGISTER
                                         ;              TIMEOUT ADDRESS REGISTER
                                         ;              MAINTENANCE REGISTER
                                         ;              CACHE PARITY REGISTER
                                         ;              TB ERROR REGISTER 1
                                         ;              TB ERROR REGISTER 0
                                         ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,1004   ;1861   TRPH1:   RC[OD]_SC
U 1004, 0000,003D,D980,0800,0084,7169   ;1862   =0       SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,104F   ;1863            Q_ID[TBER0]
U 104F, 0001,203C,4DF0,2DB0,0000,105B   ;1864            RC[6]_Q,Q_ID[TBER1]
U 105B, 0001,203C,65F0,2DB8,0000,105F   ;1865            RC[7]_Q,Q_ID[SBI.ERR]
U 105F, 0001,203C,6DF0,2DD8,0000,1109   ;1866            RC[0B]_Q,Q_ID[FAULT]
U 1109, 0001,203C,75F0,2DE0,0000,114B   ;1867            RC[0C]_Q,Q_ID[MAINT]
U 114B, 0001,203C,79F0,2DC8,0000,114C   ;1868            RC[9]_Q,Q_ID[PARITY]
U 114C, 0001,203C,69F0,2DC0,0000,114D   ;1869            RC[8]_Q,Q_ID[TIME.ADDR]
U 114D, 0001,203C,81F0,2DD0,0000,1000   ;1870            RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1163   ;1871   1000:    RC[0E]_Q,ERROR1
                                        ;1872   ;+
                                        ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1875   ;                  NEWTST
                                        ;1876   ;                  ERLOOP
                                        ;1877   ;                  ERROR1
                                        ;1878   ;                  ERROR2
                                        ;1879   ;
U 114E, 0000,003C,65F8,0800,0084,714F   ;1880   SCOPE:   SC_K[.10],Q_0                  ; SETUP TO WRITE IPL OF 1F
U 114F, 0818,0038,8D80,0800,0000,1150   ;1881            D_K[.1F]                       ; ...
U 1150, 0D00,003C,0180,0800,0000,1151   ;1882            D_DAL.SC
U 1151, 0000,003C,3D80,3C00,0000,1152   ;1883            ID[PSL]_D                      ; WRITE THE PSL
U 1152, 0818,0038,0580,0800,0000,1153   ;1884            D_K[.1]                        ; SETUP TO CLEAR THE CES REGISTER
U 1153, 0D00,003C,0180,0800,0000,1154   ;1885            D_DAL.SC
U 1154, 0F00,003C,3180,3C00,0000,1156   ;1886            ID[CES]_D,D_0                  ; CLEAR THE CES REGISTER
U 1156, 0000,003C,5D80,3C00,0000,1157   ;1887            ID[ACC.CS]_D                   ; SHUT OFF THE FLOATING POINT
U 1157, 0000,003C,3980,3C00,0000,1158   ;1888            ID[SIR]_D                      ; CLEAR THE SIR REGISTER
U 1158, 0000,003C,2980,3C00,0000,1159   ;1889            ID[CLK.CS]_D                   ; STOP INTERVAL TIMER
U 1159, 0000,003C,4980,3C00,0000,115A   ;1890            ID[TBER0]_D                    ; SHUT OFF THE TB
U 115A, 0818,0038,C180,0800,0000,115B   ;1891            D_K[.FFFF]
U 115B, 0000,003C,6580,3C00,0000,115C   ;1892            ID[SBI.ERR]_D
U 115C, 0F00,003C,6D80,3C00,0000,115D   ;1893            ID[FAULT]_D,D_0
U 115D, 0000,003C,6D80,3C00,0000,115E   ;1894            ID[FAULT]_D
U 115E, 0000,003C,6580,3C00,0000,115F   ;1895            ID[SBI.ERR]_D
U 115F, 0003,003C,0180,09F0,0000,1160   ;1896            RC[0E]_0
U 1160, 0003,003C,0180,0AF8,0000,1161   ;1897            R[0F]_0
U 1161, 0003,003C,0180,09E8,0000,105E   ;1898            RC[0D]_0,J/CALLCON             ; CALL THE CONSOLE
U 1162, 0818,0038,0980,0800,0000,105E   ;1899   ERLOOP:  D_K[.2],J/CALLCON              ; ERRLOOP CALL
U 1163, 0810,0038,0180,0978,0000,1164   ;1900   ERROR1:  D_RC[0F]
U 1164, 0819,0034,4D80,0800,0000,104E   ;1901            D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1902   104E:    D_D.OR.K[.4],J/CALLCON
U 1165, 0810,0038,0180,0978,0000,1166   ;1903   ERROR2:  D_RC[0F]
U 1166, 0819,0034,4D80,0800,0000,105A   ;1904            D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1905   105A:    D_D.OR.K[.6],J/CALLCON
                                        ;1906   105E:
                                        ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1908            ID[TXDB]_D,J/CALLCON           ; CALL THE CONSOLE
                                        ;1909   ;+
                                        ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1912   13F0:    NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1913   13F1:    NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1914   13F2:    NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1915   13F3:    NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,1167   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 1167, 0810,0038,4D80,0978,0000,1168   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 1168, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 1169, 0010,0038,01C0,0978,0000,116A   ;1943   SETRCF: Q_RC[OF]
U 116A, 0019,2034,4DC0,0800,0000,116B   ;1944           Q_Q.AND.K[.FF00]
U 116B, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946
                                        ;1947   ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                        ;1948   ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                        ;1949   ; CERTAIN TRAPS.
U 116C, 0018,0038,C180,0800,0000,116D   ;1950   DC.1DE: ALU_K[.FFFF]
U 116D, 0500,003C,0380,0800,0000,100C   ;1951           D_D.LEFT,SI/7
U 100C, 0000,003D,0180,0800,0000,1183   ;1952   =0      CALL,J/DCD
U 100D, 0000,003C,0180,0800,0000,1014   ;1953           NOP
U 1014, 0000,003D,0180,0800,0000,1184   ;1954   =0      CALL,J/DCE
U 1015, 0000,003E,0180,0800,0000,0001   ;1955           RETURN1
                                        ;1956   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 116E, 0118,0038,1B80,0800,0000,1186   ;1957   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 116F, 0118,0038,0B80,0800,0000,1186   ;1958   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1170, 0118,0038,0780,0800,0000,1186   ;1959   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 1171, 0118,0038,C380,0800,0000,1186   ;1960   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 1172, 0018,0038,1980,0800,0000,116E   ;1961   DC0:    ALU_0(K),J/S00
U 1173, 0018,0038,1980,0800,0000,116F   ;1962   DC1:    ALU_0(K),J/S01
U 1174, 0018,0038,1980,0800,0000,1170   ;1963   DC2:    ALU_0(K),J/S10
U 1175, 0018,0038,1980,0800,0000,1171   ;1964   DC3:    ALU_0(K),J/S11
U 1176, 0018,0038,0980,0800,0000,116E   ;1965   DC4:    ALU_K[.2],J/S00
U 1177, 0018,0038,0980,0800,0000,116F   ;1966   DC5:    ALU_K[.2],J/S01
U 1178, 0018,0038,0980,0800,0000,1170   ;1967   DC6:    ALU_K[.2],J/S10
U 1179, 0018,0038,0980,0800,0000,1171   ;1968   DC7:    ALU_K[.2],J/S11
U 117A, 0018,0038,0580,0800,0000,116E   ;1969   DC8:    ALU_K[.1],J/S00
U 117B, 0018,0038,0580,0800,0000,116F   ;1970   DC9:    ALU_K[.1],J/S01
```

```
U 1180, 0018,0038,0580,0800,0000,1170   ;1971   DCA:    ALU_K[.1],J/S10
U 1181, 0018,0038,0580,0800,0000,1171   ;1972   DCB:    ALU_K[.1],J/S11
U 1182, 0018,0038,C180,0800,0000,116E   ;1973   DCC:    ALU_K[.FFFF],J/S00
U 1183, 0018,0038,C180,0800,0000,116F   ;1974   DCD:    ALU_K[.FFFF],J/S01
U 1184, 0018,0038,C180,0800,0000,1170   ;1975   DCE:    ALU_K[.FFFF],J/S10
U 1185, 0018,0038,C180,0800,0000,1171   ;1976   DCF:    ALU_K[.FFFF],J/S11
U 1186, 0100,003E,0380,0800,0000,0001   ;1977   SX:     D_D.LEFT2,SI/7,RETURN1
U 1187, 0018,0038,01C0,0800,0000,101C   ;1978   DC.5:   Q_K[.8]
                                        ;1979   =0
U 101C, 0000,003D,0180,0800,0000,1177   ;1980   DC.5A:  CALL,J/DC5
U 101D, 0019,2000,05C0,0800,0010,1188   ;1981           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 1188, 0000,013C,0180,0800,0000,1044   ;1982           Z?
U 1044, 0000,003C,0180,0800,0000,101C   ;1983   =0      J/DC.5A
U 1045, 0000,003E,0180,0800,0000,0001   ;1984           RETURN1
                                        ;1985   =0
U 1046, 0000,003D,0180,0800,0000,1187   ;1986   DC.A:   CALL,J/DC.5
U 1047, 0500,003E,0180,0800,0000,0001   ;1987           D_D.LEFT,SI/ZERO,RETURN1
U 1189, 0018,0038,01C0,0800,0000,1048   ;1988   DC.9:   Q_K[.8]
                                        ;1989   =0
U 1048, 0000,003D,0180,0800,0000,117B   ;1990   DC.9A:  CALL,J/DC9
U 1049, 0019,2000,05C0,0800,0010,118A   ;1991           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 118A, 0000,013C,0180,0800,0000,104A   ;1992           Z?
U 104A, 0000,003C,0180,0800,0000,1048   ;1993   =0      J/DC.9A
U 104B, 0000,003E,0180,0800,0000,0001   ;1994           RETURN1
                                        ;1995   =0
U 104C, 0000,003D,0180,0800,0000,1189   ;1996   DC.C:   CALL,J/DC.9
U 104D, 0018,0038,C180,0800,0000,118B   ;1997           ALU_K[.FFFF]
U 118B, 0600,003E,0380,0800,0000,0001   ;1998           D_D.RIGHT,SI/7,RETURN1
                                        ;1999   =0
U 1050, 0000,003D,0180,0800,0000,1189   ;2000   DC.6:   CALL,J/DC.9
U 1051, 0018,0038,0580,0800,0000,118C   ;2001           ALU_K[.1]
U 118C, 0100,003E,0380,0800,0000,0001   ;2002           D_D.LEFT2,SI/7,RETURN1
                                        ;2003   =0
U 1052, 0000,003D,0180,0800,0000,1189   ;2004   DC.3:   CALL,J/DC.9
U 1053, 0018,0038,C180,0800,0000,118D   ;2005           ALU_K[.FFFF]
U 118D, 0500,003E,0380,0800,0000,0001   ;2006           D_D.LEFT,SI/7,RETURN1
                                        ;2007   ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
                                        ;2008   ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
                                        ;2009   ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 118E, 0000,003F,0180,0800,0000,117C   ;2010   TARGC3: SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001   ;2011   117C:   RETURN1
U 117D, 0000,003E,0180,0800,0000,0002   ;2012   117D:   RETURN2
U 117E, 0000,003E,0180,0800,0000,0003   ;2013   117E:   RETURN3
U 117F, 0000,003E,0180,0800,0000,0004   ;2014   117F:   RETURN4
U 11FC, 0000,003D,0180,0800,0000,1163   ;2015   11FC:   ERROR1
U 11FD, 0000,003D,0180,0800,0000,1163   ;2016   11FD:   ERROR1
U 11FE, 0000,003D,0180,0800,0000,1163   ;2017   11FE:   ERROR1
U 11FF, 0000,003D,0180,0800,0000,1163   ;2018   11FF:   ERROR1
                                        ;2019   ; THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAAA IN THE D REGISTER.
U 118F, 0F18,0038,5DC0,0800,0000,1054   ;2020   DCLA:   D_0,Q_K[.7]
                                        ;2021   =0
U 1054, 0000,003D,0180,0800,0000,1180   ;2022   DCLA1:  CALL,J/DCA
U 1055, 0001,203C,0180,0800,0010,1190   ;2023           ALU_Q,CLK.UBCC
U 1190, 0000,013C,0180,0800,0000,1056   ;2024           Z?
U 1056, 0019,2000,05C0,0800,0010,1054   ;2025   =0      Q_Q-K[.1],J/DCLA1
```

```
U 1057, 0000,003E,0180,0800,0000,0001   ;2026           RETURN1
                                        ;2027   ; THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
                                        ;2028   ; THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
                                        ;2029   ; IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED, IF NO
                                        ;2030   ; UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
                                        ;2031   ; IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
                                        ;2032   ; TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
                                        ;2033   ; WILL CONTAIN THE READ DATA.
                                        ;2034   =0
U 1058, 0F00,003D,0180,0800,0000,1178   ;2035   RHOH1:  D_0,CALL,J/DC6
U 1059, 0000,003C,0180,0800,0000,1063   ;2036           J/READ
                                        ;2037   =0
U 105C, 0F00,003D,0180,0800,0000,1174   ;2038   RHOM1:  D_0,CALL,J/DC2
U 105D, 0000,003C,0180,0800,0000,1063   ;2039           J/READ
                                        ;2040   =0
U 1060, 0F00,003D,0180,0800,0000,1176   ;2041   RMOH1:  D_0,CALL,J/DC4
U 1061, 0000,003C,0180,0800,0000,1063   ;2042           J/READ
                                        ;2043   =0
U 1062, 0F00,003C,0180,0800,0000,1063   ;2044   RMOM1:  D_0,J/READ
U 1063, 0000,003C,01F8,0800,0084,7191   ;2045   READ:   SC_K[.8],Q_0            ; CALCULATE THE EXPECTED HIT/MISS BITS
U 1191, 0D00,003C,0180,0800,0000,1192   ;2046           D_DAL.SC
U 1192, 0001,003C,0180,09E8,0000,1193   ;2047           RC[OD]_D
U 1193, 0000,003C,0180,0A70,0000,1194   ;2048           LAB_R[OE]
U 1194, 0000,003C,0180,52F8,0000,1195   ;2049           R[OF]_LA,FS/MCT,MCT/READ.V.WCHK
U 1195, 0001,003C,0180,09D0,0000,1196   ;2050           RC[OA]_D
U 1196, 0000,003C,75F0,2C00,0000,1197   ;2051           Q_ID[MAINT]
U 1197, 0800,003C,0180,0A78,0000,1198   ;2052           D_R[OF]
U 1198, 0003,003C,0180,0AF8,0000,1199   ;2053           R[OF]_0
U 1199, 0001,203C,0180,09E0,0000,119A   ;2054           RC[OC]_Q
U 119A, 0000,003C,01C0,0A70,0000,119B   ;2055           Q_R[OE]
U 119B, 0001,003C,0180,09C8,0000,119C   ;2056           RC[9]_D
U 119C, 001D,2000,0180,0800,0010,119D   ;2057           ALU_Q-D,CLK.UBCC
U 119D, 0000,013C,0180,0800,0000,1064   ;2058           Z?
U 1064, 0000,003C,0180,0800,0000,11A4   ;2059   =0      J/RERR
U 1065, 0818,0038,D5F8,0800,0000,119E   ;2060           Q_0,D_K[.6]
U 119E, 0000,003C,0180,0800,0084,719F   ;2061           SC_K[.8]
U 119F, 0D10,0038,01C0,0960,0000,11A0   ;2062           D_DAL.SC,Q_RC[OC]
U 11A0, 001D,2034,01C0,0800,0000,11A1   ;2063           ALU_Q[AND]D,Q_ALU
U 11A1, 0810,0038,0180,0968,0000,11A2   ;2064           D_RC[OD]
U 11A2, 001D,2000,0180,0800,0010,11A3   ;2065           ALU_Q-D,CLK.UBCC
U 11A3, 0000,013C,0180,0800,0000,1066   ;2066           Z?
U 1066, 0000,003E,0180,0800,0000,0002   ;2067   =0      RETURN2
U 1067, 0810,003A,0180,0950,0000,0003   ;2068           D_RC[OA],RETURN3
U 11A4, 0000,003C,79F0,2C00,0000,11A5   ;2069   RERR:   Q_ID[PARITY]
U 11A5, 0001,203E,0180,09E8,0000,0001   ;2070           RC[OD]_Q,RETURN1
                                        ;2071   ; THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
                                        ;2072   ; AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
                                        ;2073   ; ELSE RETURN2.
U 11A6, 0000,003C,0180,0A70,0000,11A7   ;2074   WRITE:  LAB_R[OE]
U 11A7, 0000,003C,0180,32F8,0000,11A8   ;2075           R[OF]_LA,FS/MCT,MCT/WRITE.V.WCHK
U 11A8, 0800,003C,0180,0A78,0000,11A9   ;2076           D_R[OF]
U 11A9, 0003,003C,0180,0AF8,0000,11AA   ;2077           R[OF]_0
U 11AA, 0000,003C,01C0,0A70,0000,11AB   ;2078           Q_R[OE]
U 11AB, 001D,2000,0180,0800,0010,11AC   ;2079           ALU_Q-D,CLK.UBCC
U 11AC, 0000,013C,0180,0800,0000,1068   ;2080           Z?
```

```
U 1068, 0000,003C,0180,0800,0000,11A4   ;2081   =0      J/RERR                  ; UTRAPPED.
U 1069, 0000,003E,0180,0800,0000,0002   ;2082           RETURN2                 ; OK NO UTRAP.
                                        ;2083   ; THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
                                        ;2084   ; REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
                                        ;2085   ; CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
                                        ;2086   ; NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
                                        ;2087   ; DISSABLE SBI CYCLES:
U 11AD, 0F00,003C,0180,0800,0000,11AE   ;2088   SOFF:   D_0
U 11AE, 0000,003C,8580,0800,0084,71AF   ;2089   S1:     SC_K[.C]
U 11AF, 0801,001C,0180,0800,0000,11B0   ;2090           ALU_D.ORNOT.MASK,D_ALU
U 11B0, 0000,003E,7580,3C00,0000,0001   ;2091           ID[MAINT]_D,RETURN
                                        ;2092   ; SET FORCE REPLACE GROUP ZERO BIT
U 11B1, 0F00,003C,0180,0800,0000,11B2   ;2093   R0S:    D_0
U 11B2, 0000,003C,6180,0800,0084,71B3   ;2094   S2:     SC_K[.F]
U 11B3, 0000,003C,0580,0800,0084,B1B4   ;2095           SC_SC-K[.1]
U 11B4, 0801,001C,0180,0800,0000,11AE   ;2096   S3:     ALU_D.ORNOT.MASK,D_ALU,J/S1
                                        ;2097   ; SET FORCE REPLACE GROUP 1 BIT
U 11B5, 0F00,003C,0180,0800,0000,11B6   ;2098   R1S:    D_0
U 11B6, 0000,003C,8980,0800,0084,71B4   ;2099   S4:     SC_K[.D],J/S3
                                        ;2100   ; SET FORCE MISS GROUP 0 BIT
U 11B7, 0F00,003C,0180,0800,0000,11B8   ;2101   M0S:    D_0
U 11B8, 0000,003C,6580,0800,0084,71B4   ;2102   S5:     SC_K[.10],J/S3
                                        ;2103   ; SET FORCE MISS GROUP 1 BIT
U 11B9, 0F00,003C,0180,0800,0000,11BA   ;2104   M1S:    D_0
U 11BA, 0000,003C,6180,0800,0084,71B4   ;2105   S6:     SC_K[.F],J/S3
                                        ;2106   ; SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
U 11BB, 0F00,003C,0180,0800,0000,11BC   ;2107   M10S:   D_0
U 11BC, 0000,003C,6180,0800,0084,71BD   ;2108           SC_K[.F]
U 11BD, 0801,001C,0180,0800,0000,11B8   ;2109   S7:     ALU_D.ORNOT.MASK,D_ALU,J/S5
                                        ;2110   ; SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
U 11BE, 0F00,003C,0180,0800,0000,11BF   ;2111   R0M1S:  D_0
U 11BF, 0000,003C,6180,0800,0084,71C0   ;2112           SC_K[.F]
U 11C0, 0801,001C,0180,0800,0000,11B2   ;2113           ALU_D.ORNOT.MASK,D_ALU,J/S2
                                        ;2114   ; SET FORCE REPLACE GROUP 1 FORCE MISS GROUP 0 BITS
U 11C1, 0F00,003C,8980,0800,0084,71BD   ;2115   R1M0S:  D_0,SC_K[.D],J/S7
                                        ;2116   ; THIS SUBROUTINE IS CALLED TO GENERATE SOME BASIC DATA AND ADDRESS
                                        ;2117   ; PATTERNS WHICH ARE USED BY MANY OF THE CACHE TESTS. IT LEAVES
                                        ;2118   ; THESE PATTERNS IN THE RC SCRATCH PADS.
                                        ;2119   ;       RC[0]           AAAAAAAA
                                        ;2120   ;       RC[1]           19999000
                                        ;2121   ;       RC[2]           55555555
                                        ;2122   ;       RC[3]           06666000
                                        ;2123   ;       RC[4]           99999999
                                        ;2124   ;       RC[5]           1B6DB000
                                        ;2125   ;       RC[6]           66666666
                                        ;2126   ;       RC[7]           04924000
U 11C2, 0F18,0038,5DC0,0800,0000,106A   ;2127   CAPAT:  Q_K[.7],D_0
                                        ;2128   =0
U 106A, 0000,003D,0180,0800,0000,1180   ;2129   CAP1:   CALL,J/DCA
U 106B, 0001,203C,0180,0800,0010,11C3   ;2130           ALU_Q,CLK.UBCC
U 11C3, 0000,013C,0180,0800,0000,106C   ;2131           Z?
U 106C, 0019,2000,05C0,0800,0000,106A   ;2132   =0      Q_Q-K[.1],J/CAP1
U 106D, 0001,003C,0180,0980,0000,11C4   ;2133           RC[0]_D
U 11C4, 0001,0028,0180,0990,0000,11C5   ;2134           ALU_NOT.D,RC[2]_ALU
U 11C5, 0F18,0038,5DC0,0800,0000,106E   ;2135           Q_K[.7],D_0
```

```
                                            ;2136   =0
U 106E, 0000,003D,0180,0800,0000,117B       ;2137   CAP2:   CALL,J/DC9
U 106F, 0001,203C,0180,0800,0010,11C6       ;2138           ALU_Q,CLK.UBCC
U 11C6, 0000,013C,0180,0800,0000,1070       ;2139           Z?
U 1070, 0019,2000,05C0,0800,0000,106E       ;2140   =0      Q_Q-K[.1],J/CAP2
U 1071, 0001,003C,0180,09A0,0000,11C7       ;2141           RC[4]_D
U 11C7, 0001,0028,0180,09B0,0000,11C8       ;2142           ALU_NOT.D,RC[6]_ALU
U 11C8, 0000,003C,89F8,0800,0084,71C9       ;2143           Q_0,SC_K[.D]
U 11C9, 0D00,003C,0180,0800,0000,11CA       ;2144           D_DAL.SC
U 11CA, 0600,003C,0180,0800,0000,11CB       ;2145           D_D.RIGHT,SI/ZERO
U 11CB, 0001,003C,0180,0988,0000,11CC       ;2146           RC[1]_D
U 11CC, 0810,0038,65F8,0930,0084,71CD       ;2147           D_RC[6],SC_K[.10],Q_0
U 11CD, 0D00,003C,0180,0800,0000,11CE       ;2148           D_DAL.SC
U 11CE, 0200,003C,0180,0800,0000,11CF       ;2149           D_D.RIGHT2,SI/ZERO
U 11CF, 0200,003C,0180,0800,0000,11D0       ;2150           D_D.RIGHT2,SI/ZERO
U 11D0, 0F01,003C,0180,0998,0000,1072       ;2151           RC[3]_D,D_0
U 1072, 0000,003D,0180,0800,0000,117B       ;2152   =0      CALL,J/DC9
U 1073, 0100,003C,0180,0800,0000,1074       ;2153           D_D.LEFT2,SI/ZERO
U 1074, 0000,003D,0180,0800,0000,117B       ;2154   =0      CALL,J/DC9
U 1075, 0500,003C,0180,0800,0000,1076       ;2155           D_D.LEFT,SI/ZERO
U 1076, 0000,003D,0180,0800,0000,1176       ;2156   =0      CALL,J/DC4
U 1077, 0001,0028,0180,09A8,0000,11D1       ;2157           ALU_NOT.D,RC[5]_ALU
U 11D1, 0000,003C,85F8,0800,0084,71D2       ;2158           SC_K[.C],Q_0
U 11D2, 0D00,003C,0180,0800,0000,11D3       ;2159           D_DAL.SC
U 11D3, 0001,003C,0180,09B8,0000,11D4       ;2160           RC[7]_D
U 11D4, 0810,0038,0180,0928,0000,11D5       ;2161           D_RC[5]
U 11D5, 0000,003C,61F8,0800,0084,71D6       ;2162           SC_K[.F],Q_0
U 11D6, 0D00,003C,0180,0800,0000,11D7       ;2163           D_DAL.SC
U 11D7, 0200,003C,0180,0800,0000,11D8       ;2164           D_D.RIGHT2,SI/ZERO
U 11D8, 0600,003C,0180,0800,0000,11D9       ;2165           D_D.RIGHT,SI/ZERO
U 11D9, 0001,003E,0180,09A8,0000,0001       ;2166           RC[5]_D,RETURN1
                                            ;2167   ;+
                                            ;2168   ; THE FOLLOWING SUBROUTINE GENERATES CONSTANTS AND SAVES THEM IN THE RA
                                            ;2169   ; SCRATCH PADS. FOLLOWING ARE THE CONSTANTS GENERATED:
                                            ;2170   ;
                                            ;2171   ;       R[2] = FORCE REPLACE GROUP 1 AND FORCE MISS GROUP 0
                                            ;2172   ;       R[3] = R[6] PLUS DISABLE SBI CYCLE
                                            ;2173   ;       R[4] = CPU ADDRESS FOR AUTO REFILL (0)
                                            ;2174   ;       R[5] = IB ADDRESS FOR AUTO REFILL (3FC)
                                            ;2175   ;       R[6] = FORCE REPLACE GROUP 0 AND FORCE MISS GROUP 1
                                            ;2176   ;       R[7] = GROUP 0 AND GROUP 1 MATCH BIT MASK
                                            ;2177   ;       R[8] = GROUP 0 MATCH BIT
                                            ;2178   ;       R[9] = GROUP 1 MATCH BIT
                                            ;2179   ;       R[A] = R[6] PLUS REVERSE PARITY GROUP 0, BYTE 0 (DATA)
                                            ;2180   ;       R[B] = TIMEOUT ADDRESS ( = 01000000 )
                                            ;2181   ;       R[C] = SILO COUNTER MASK
                                            ;2182   ;       R[D] = ADDRESS TO FORCE RDS (4020)
                                            ;2183   ;       R[E] = ADDRESS OF MEMORY CONFIGURATION REGISTER B
                                            ;2184   ;-
                                            ;2185   REGISTERSETUP:
U 11DA, 0003,003C,0180,0AA0,0000,1078       ;2186           R[4]_0
U 1078, 0818,0039,5580,0800,0000,1182       ;2187   =0      D_K[.3F],CALL,J/DCC                ; GENERATE 3FC
U 1079, 0001,003C,0180,0AA8,0000,107A       ;2188           R[5]_D                             ; SAVE
U 107A, 0818,0039,7580,0800,0000,1172       ;2189   =0      D_K[.20],CALL,J/DC0                ; GENERATE 200(X)
U 107B, 0001,003C,0180,0AC0,0000,11DB       ;2190           R[8]_D                             ; GROUP 0 MATCH BIT
```

```
U 11DB, 0501,003C,0180,0AB8,0000,11DC   ;2191          R[7]_D,D_D.LEFT              ; PART OF MASK
U 11DC, 0001,003C,0180,0AC8,0000,11DD   ;2192          R[9]_D                       ; GROUP 1 MATCH BIT
U 11DD, 0000,003C,0180,0A38,0000,11DE   ;2193          LAB_R[7]
U 11DE, 001C,2030,0180,0AB8,0000,11DF   ;2194          R[7]_LA.OR.D                 ; COMPLETE THE MASK
U 11DF, 0100,003C,0180,0800,0000,11E0   ;2195          D_D.LEFT2
U 11E0, 0500,003C,0180,0800,0000,11E1   ;2196          D_D.LEFT                     ; GENERATE FR GR0 AND FM GR1
U 11E1, 0501,003C,0180,0A90,0000,11E2   ;2197          R[2]_D,D_D.LEFT
U 11E2, 0500,003C,01E0,0800,0000,11E3   ;2198          Q_D,D_D.LEFT                 ; ...
U 11E3, 081D,0030,01E0,0AB0,0000,11E4   ;2199          R[6]_D.OR.Q,D_ALU,Q_D        ; SAVE
U 11E4, 0000,003C,7580,3C00,0000,11E5   ;2200          ID[MAINT]_D                  ; SETUP THE MAINTENANCE REGISTER
U 11E5, 0000,003C,8580,0800,0084,71E6   ;2201          SC_K[.C]                     ; SETUP TO GENERATE BIT 12
U 11E6, 0801,001C,0180,0800,0000,11E7   ;2202          D_D.ORNOT.MASK               ; INSERT BIT 12
U 11E7, 0001,003C,0180,0A98,0000,11E8   ;2203          R[3]_D                       ; SAVE
U 11E8, 0C00,003C,0180,0A10,0000,11E9   ;2204          LAB_R[2],D_Q                 ; COMPLETE DATA FOR R2
U 11E9, 0500,003C,0180,0800,0000,11EA   ;2205          D_D.LEFT
U 11EA, 001C,2030,0180,0A90,0000,11EB   ;2206          R[2]_LA.OR.D                 ;
U 11EB, 0818,0038,5180,0800,0000,11EC   ;2207          D_K[.1E]                     ; GENERATE CONSTANT FOR R[A]
U 11EC, 0000,003C,65F8,0800,0084,71ED   ;2208          SC_K[.10],Q_0                ; ...
U 11ED, 0D00,003C,01C0,0A30,0000,11EE   ;2209          D_DAL.SC,Q_R[6]              ; ...
U 11EE, 001D,0032,0180,0AD0,0000,0001   ;2210          R[0A]_D.OR.Q,RETURN1         ; SAVE
```

```
                                                .PAGE   "TEST DF       DUAL ADDRESSING TEST OF CACHE TAG STORE"
                                          ;***************************************************************************
                                          ;++
                                          ;
                                          ; TEST  DF      DUAL ADDRESSING TEST OF CACHE TAG STORE
                                          ;
                                          ; TEST DESCRIPTION
                                          ;
                                          ;       THIS TEST DOES A CURSORY CHECK OF THE ADDRESS LINES ON THE
                                          ;       CACHE ADDRESS MATRIX. THIS IS DONE WITH THE FOLLOWING SEQUENCE:
                                          ;
                                          ;       1) VALIDATE LOC 0               3) VALIDATE LOC 10
                                          ;          VALIDATE LOC 1FFFF008           VALIDATE LOC 1FFFF020
                                          ;          CHECK LOC 0                     CHECK LOC 10
                                          ;                                          CHECK LOC 8
                                          ;       2) VALIDATE LOC 8                  CHECK LOC 0
                                          ;          VALIDATE LOC 1FFFF010
                                          ;          CHECK LOC 8                  4) ETC...
                                          ;          CHECK LOC 0
                                          ;
                                          ;       THE CHECK IS MADE BY LOOKING AT THE HIT/MISS BIT TO ENSURE THAT
                                          ;       THE LOCATION IS A HIT.
                                          ;
                                          ;       SUBTEST 1 - CHECK CACHE GROUP 0
                                          ;
                                          ;       SUBTEST 2 - CHECK CACHE GROUP 1
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;
                                          ;       THIS TEST CHECKS THE ADDRESS LINES TO THE CACHE TAG STORE CHIPS
                                          ;       ON THE CAM MODULE.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;
                                          ;       DATA: ADDRESS VALIDATED AS ONE'S (1FFFF008, 1FFFF010, 1FFFF020, ETC.)
                                          ;             ADDRESS BEING CHECK FOR A HIT (0, 8, 10, 20, 40, ETC.)
                                          ;
                                          ;             ID[PARITY]
                                          ;--
                                          ;****************************************************************************
                                          =0
U 107C, 0000,003D,0180,0800,0000,114E     T001:   NEWTST
U 107D, 0018,0038,0D80,09F8,0000,107E             RC[OF]_K[.3]
U 107E, 0000,003D,0180,0800,0000,11DA     =0      CALL,J7REGISTERSETUP          ; SETUP SOME REGISTERS
U 107F, 0800,003C,0180,0A18,0000,11EF             D_R[3]                        ; GET MAINT REG DATA
U 11EF, 0000,003C,7580,3C00,0000,1080             ID[MAINT]_D
                                          ;//////////////////////////////////////////////////////////////////////////
                                          ;+
                                          ; CHECK GROUP 0 (MAINT REG IS SETUP TO FORCE MISS GROUP 1 AND FORCE
                                          ; REPLACE GROUP 0)
                                          ;-
U 1080, 0000,003D,0180,0800,0000,1167     =0      SUBTEST
U 1081, 0818,0038,C180,0800,0000,11F0             D_K[.FFFF]                    ; GENERATE INITIAL ADDRESS
U 11F0, 0500,003C,8580,0800,0084,71F1             D_D.LEFT,SC_K[.C]             ; THAT IS BEING WRITTEN WITH
U 11F1, 0819,0030,05F8,0800,0000,11F2             D_D.OR.K[.1],Q_0              ; ONE'S
```

```
U 11F2, 0D00,003C,0180,0800,0000,11F3   ;2266           D_DAL.SC
U 11F3, 0019,0030,0180,09F0,0000,11F4   ;2267           RC[OE]_D.OR.K[.8]                 ; EQUALS 1FFFF008(X)
U 11F4, 0003,003C,0180,0A80,0000,1082   ;2268           R[0]_0                            ; INIT ADDRESS TO WRITE ZERO'S
U 1082, 0818,0039,4980,0800,0000,1185   ;2269   =0      D_K[.FF],CALL[DCF]                ; GENERATE MASK FOR THE ADDRESS
U 1083, 0001,003C,0180,0980,0000,1084   ;2270           RC[0]_D                           ; FIELD OF THE PHYSICAL ADDRESS
U 1084, 0000,003D,0180,0800,0000,1162   ;2271   =0      ERLOOP
U 1085, 0000,003C,0180,0A00,0200,11F5   ;2272   LOOPA:  VA_ALU,ALU_R[0]                   ; LOAD ADDRESS TO WRITE ZERO'S
U 11F5, 0000,003C,0180,9800,0000,11F6   ;2273           MCT/VALIDATE                      ; MAKE IT A HIT
U 11F6, 0010,0038,0180,0970,0200,11F7   ;2274           VA_ALU,ALU_RC[OE]                 ; LOAD ADDRESS TO WRITE ONE'S
U 11F7, 0000,003C,0180,9800,0000,11F8   ;2275           MCT/VALIDATE                      ; MAKE IT A HIT
U 11F8, 0010,0038,01C0,0970,0000,11F9   ;2276           Q_RC[OE]                          ; GENERATE ADDRESS TO CHECK
U 11F9, 0011,2034,01C0,0900,0000,11FA   ;2277           Q_Q.AND.RC[0]                     ; ...
U 11FA, 0000,003C,01B0,0800,0000,11FB   ;2278   LOOPB:  Q_Q.RIGHT                         ; ...
U 11FB, 0019,2024,5DC0,09E8,0200,1200   ;2279           Q_Q.ANDNOT.K[.7],VA_ALU,RC[OD]_ALU      ; MASK
U 1200, 0000,003C,0180,0800,0084,7201   ;2280           SC_K[.8]
U 1201, 0003,001C,0180,0AF8,0000,1202   ;2281           R[OF]_NOT.MASK                    ; SET BIT TO CATCH PARITY TRAP
U 1202, 0000,003C,0180,C800,0000,1203   ;2282           D[LONG]_CACHE.P                   ; CHECK FOR A HIT AT OLD ADDRESSES
U 1203, 0000,003C,79F0,2C00,0000,1204   ;2283           Q_ID[PARITY]                      ; CACHE PARITY UTRAP?
U 1204, 0001,203C,0180,09E0,0000,1205   ;2284           RC[OC]_Q
U 1205, 0000,003C,0180,0A78,0010,1206   ;2285           ALU_R[OF],CLK.UBCC
U 1206, 0000,013C,0180,0800,0000,1086   ;2286           Z?
U 1086, 0000,003C,0180,0800,0000,1089   ;2287   =0      J/LOOPB1
U 1087, 0000,003C,0180,0800,0000,1088   ;2288           NOP
U 1088, 0000,003D,0180,0800,0000,1165   ;2289   =0      ERROR2                            ; CACHE PARITY UTRAP OCCURRED
U 1089, 0000,003C,75F0,2C00,0000,1207   ;2290   LOOPB1: Q_ID[MAINT]                       ; READ THE HIT/MISS BITS
U 1207, 001C,0034,01C0,0A40,0010,1208   ;2291           Q_Q.AND.R[8],CLK.UBCC             ; CHECK FOR A HIT IN GROUP 0
U 1208, 0000,013C,0180,0800,0000,108A   ;2292           Z?                                ; BRANCH IF NO HIT
U 108A, 0000,003C,0180,0800,0000,108D   ;2293   =0      J/HITGO
U 108B, 0000,003C,0180,0800,0000,108C   ;2294           NOP
U 108C, 0000,003D,0180,0800,0000,1165   ;2295   =0      ERROR2                            ; DUAL ADDRESSING PROBLEM
U 108D, 0010,0038,0180,0968,0010,1209   ;2296   HITGO:  ALU_RC[OD],CLK.UBCC               ; DONE CHECKING?
U 1209, 0000,013C,0180,0800,0000,108E   ;2297           Z?                                ; BRANCH IF YES
U 108E, 0010,0038,01C0,0968,0000,11FA   ;2298   =0      Q_RC[OD],J/LOOPB                  ; CHECK THE NEXT ADDRESS
U 108F, 0810,0038,0180,0970,0000,120A   ;2299           D_RC[OE]                          ; GET ADR WRITTEN AS ONE'S
U 120A, 0811,0034,01C0,0900,0000,120B   ;2300           D_D[AND]RC[0],Q_ALU               ; GET THE TAG PART ONLY
U 120B, 0001,003C,0180,0A80,0000,120C   ;2301           R[0]_D                            ; SET NEW ADDRESS TO WRITE AS ZERO'S
U 120C, 081D,0014,0180,0800,0000,120D   ;2302           D_D+Q                             ; SHIFT THE TAG BIT LEFT
U 120D, 0010,0038,01C0,0970,0000,120E   ;2303           Q_RC[OE]                          ; NOW INSERT THE NEW TAG
U 120E, 0011,2024,01C0,0900,0000,120F   ;2304           Q_Q.ANDNOT.RC[0]                  ; INTO THE ALL ONE'S PATTERN
U 120F, 001D,0030,0180,09F0,0000,1210   ;2305           RC[OE]_D.OR.Q                     ; ...
U 1210, 0011,0034,0180,0900,0010,1211   ;2306           ALU_D[AND]RC[0],CLK.UBCC          ; DONE WITH TEST?
U 1211, 0000,013C,0180,0800,0000,1090   ;2307           Z?
U 1090, 0000,003C,0180,0800,0000,1085   ;2308   =0      J/LOOPA                           ; CONTINUE WITH NEXT ADDRESS
U 1091, 0000,003C,0180,0800,0000,1092   ;2309           NOP
                                        ;2310   ;//////////////////////////////////////////////////////////////////////
                                        ;2311   ;+
                                        ;2312   ; NOW CHECK GROUP 1
                                        ;2313   ;-
U 1092, 0000,003D,0180,0800,0000,1167   ;2314   =0      SUBTEST
U 1093, 0800,003C,8580,0A10,0084,7212   ;2315           D_R[2],SC_K[.C]                   ; GEN MAINT REG DATA
U 1212, 0801,001C,0180,0800,0000,1213   ;2316           D_D.ORNOT.MASK
U 1213, 0000,003C,7580,3C00,0000,1214   ;2317           ID[MAINT]_D
U 1214, 0818,0038,C180,0800,0000,1215   ;2318           D_K[.FFFF]                        ; GENERATE INITIAL ADDRESS
U 1215, 0500,003C,8580,0800,0084,7216   ;2319           D_D.LEFT,SC_K[.C]                 ; THAT IS BEING WRITTEN WITH
U 1216, 0819,0030,05F8,0800,0000,1217   ;2320           D_D.OR.K[.1],Q_0                  ; ONE'S
```

```
U 1217, 0D00,003C,0180,0800,0000,1218   ;2321           D_DAL.SC
U 1218, 0019,0030,0180,09F0,0000,1219   ;2322           RC[0E]_D.OR.K[.8]               ; EQUALS 1FFFF008(X)
U 1219, 0003,003C,0180,0A80,0000,1094   ;2323           R[0]_0                          ; INIT ADDRESS TO WRITE ZERO'S
U 1094, 0000,003D,0180,0800,0000,1162   ;2324   =0      ERLOOP
U 1095, 0000,003C,0180,0A00,0200,121A   ;2325   LOOPC:  VA_ALU,ALU_R[0]                 ; LOAD ADDRESS TO WRITE ZERO'S
U 121A, 0000,003C,0180,9800,0000,121B   ;2326           MCT/VALIDATE                    ; MAKE IT A HIT
U 121B, 0010,0038,0180,0970,0200,121C   ;2327           VA_ALU,ALU_RC[0E]               ; LOAD ADDRESS TO WRITE ONE'S
U 121C, 0000,003C,0180,9800,0000,121D   ;2328           MCT/VALIDATE                    ; MAKE IT A HIT
U 121D, 0010,0038,01C0,0970,0000,121E   ;2329           Q_RC[0E]                        ; GENERATE ADDRESS TO CHECK
U 121E, 0011,2034,01C0,0900,0000,121F   ;2330           Q_Q.AND.RC[0]                   ; ...
U 121F, 0000,003C,01B0,0800,0000,1220   ;2331   LOOPD:  Q_Q.RIGHT                       ; ...
U 1220, 0019,2024,5DC0,09E8,0200,1221   ;2332           Q_Q.ANDNOT.K[.7],VA_ALU,RC[0D]_ALU      ; MASK
U 1221, 0000,003C,0180,0800,0084,7222   ;2333           SC_K[.8]                        ; SET BIT FOR TRAP CATCHER
U 1222, 0003,001C,0180,0AF8,0000,1223   ;2334           R[0F]_NOT.MASK                  ; ...
U 1223, 0000,003C,0180,C800,0000,1224   ;2335           D[LONG]_CACHE.P                 ; CHECK FOR A HIT AT OLD ADDRESSES
U 1224, 0000,003C,79F0,2C00,0000,1225   ;2336           Q_ID[PARITY]
U 1225, 0001,203C,0180,09E0,0000,1226   ;2337           RC[0C]_Q
U 1226, 0000,003C,0180,0A78,0010,1227   ;2338           ALU_R[0F],CLK.UBCC              ; SEE IF CACHE PARITY TRAPPED
U 1227, 0000,013C,0180,0800,0000,1096   ;2339           Z?
U 1096, 0000,003C,0180,0800,0000,1099   ;2340   =0      J/LOOPD1                        ; NO CACHE PARITY TRAP
U 1097, 0000,003C,0180,0800,0000,1098   ;2341           NOP
U 1098, 0000,003D,0180,0800,0000,1165   ;2342   =0      ERROR2                          ; A CACHE PARITY TRAP OCCURRED
U 1099, 0000,003C,75F0,2C00,0000,1228   ;2343   LOOPD1: Q_ID[MAINT]                     ; READ THE HIT/MISS BITS
U 1228, 001C,0034,01C0,0A48,0010,1229   ;2344           Q_Q.AND.R[9],CLK.UBCC           ; CHECK FOR A HIT IN GROUP 1
U 1229, 0000,013C,0180,0800,0000,109A   ;2345           Z?                              ; BRANCH IF NO HIT
U 109A, 0000,003C,0180,0800,0000,109D   ;2346   =0      J/HITG1
U 109B, 0000,003C,0180,0800,0000,109C   ;2347           NOP
U 109C, 0000,003D,0180,0800,0000,1165   ;2348   =0      ERROR2                          ; DUAL ADDRESSING PROBLEM
U 109D, 0010,0038,0180,0968,0010,122A   ;2349   HITG1:  ALU_RC[0D],CLK.UBCC             ; DONE CHECKING?
U 122A, 0000,013C,0180,0800,0000,109E   ;2350           Z?                              ; BRANCH IF YES
U 109E, 0010,0038,01C0,0968,0000,121F   ;2351   =0      Q_RC[0D],J/LOOPD                ; CHECK THE NEXT ADDRESS
U 109F, 0810,0038,0180,0970,0000,122B   ;2352           D_RC[0E]                        ; GET ADR WRITTEN AS ONE'S
U 122B, 0811,0034,01C0,0900,0000,122C   ;2353           D_D[AND]RC[0],Q_ALU             ; GET THE TAG PART ONLY
U 122C, 0001,003C,0180,0A80,0000,122D   ;2354           R[0]_D                          ; SET NEW ADDRESS TO WRITE AS ZERO'S
U 122D, 081D,0014,0180,0800,0000,122E   ;2355           D_D+Q                           ; SHIFT THE TAG BIT LEFT
U 122E, 0010,0038,01C0,0970,0000,122F   ;2356           Q_RC[0E]                        ; NOW INSERT THE NEW TAG
U 122F, 0011,2024,01C0,0900,0000,1230   ;2357           Q_Q.ANDNOT.RC[0]                ; INTO THE ALL ONE'S PATTERN
U 1230, 001D,0030,0180,09F0,0000,1231   ;2358           RC[0E]_D.OR.Q                   ; ...
U 1231, 0011,0034,0180,0900,0010,1232   ;2359           ALU_D[AND]RC[0],CLK.UBCC        ; DONE WITH TEST?
U 1232, 0000,013C,0180,0800,0000,10A0   ;2360           Z?
U 10A0, 0000,003C,0180,0800,0000,1095   ;2361   =0      J/LOOPC                         ; CONTINUE WITH NEXT ADDRESS
U 10A1, 0000,003C,0180,0800,0000,10A2   ;2362           NOP
```

```
                                              .PAGE   "TEST E0       DUAL ADDRESSING TEST OF CACHE VALID BIT"
                                       ;*********************************************************************
                                       ;++
                                       ;
                                       ; TEST  E0      DUAL ADDRESSING TEST OF CACHE VALID BIT
                                       ;
                                       ; TEST DESCRIPTION
                                       ;
                                       ;       THIS TEST PERFORMS A CURSORY CHECK OF THE ADDRESS LINES ON THE
                                       ;       CACHE VALID BIT MEMORY. THIS IS DONE WITH THE FOLLOWING SEQUENCE:
                                       ;
                                       ;       1) INVALIDATE LOC 0              3) INVALIDATE LOC 10
                                       ;          VALIDATE LOC 8                   VALIDATE LOC 20
                                       ;          CHECK LOC 0 FOR INVALID          CHECK LOC 10 FOR INVALID
                                       ;                                           CHECK LOC 8 FOR INVALID
                                       ;       2) INVALIDATE LOC 8                 CHECK LOC 0 FOR INVALID
                                       ;          VALIDATE LOC 10
                                       ;          CHECK LOC 8 FOR INVALID      4) ETC...
                                       ;          CHECK LOC 0 FOR INVALID
                                       ;
                                       ;       SUBTEST 1 - CHECK THE GROUP 0 VALID MEMORY
                                       ;
                                       ;       SUBTEST 2 - CHECK THE GROUP 1 VALID MEMORY
                                       ;
                                       ; LOGIC DESCRIPTION
                                       ;
                                       ;       THIS TEST CHECKS THE ADDRESS LINES ON THE VALID BIT MEMORY OF THE
                                       ;       CACHE ON THE CAM MODULE.
                                       ;
                                       ; ERROR DESCRIPTION
                                       ;
                                       ;       DATA: ADDRESS THAT IS MARKED VALID
                                       ;             ADDRESS THAT IS BEING CHECKED FOR INVALID
                                       ;             ID[PARITY]
                                       ;--
                                       ;*********************************************************************
                                       =0
U 10A2, 0000,003D,0180,0800,0000,114E  T002:   NEWTST
U 10A3, 0018,0038,0D80,09F8,0000,10A4          RC[0F]_K[.3]
U 10A4, 0000,003D,0180,0800,0000,11DA  =0      CALL,J7REGISTERSETUP           ; SETUP SOME REGISTERS
U 10A5, 0800,003C,0180,0A18,0000,1233          D_R[3]                         ; GET MAINT REG DATA
U 1233, 0000,003C,7580,3C00,0000,10A6          ID[MAINT]_D
                                       ;/////////////////////////////////////////////////////////////////////
                                       ;+
                                       ; CHECK THE VALID BIT MEMORY IN GROUP 0
                                       ;-
U 10A6, 0000,003D,0180,0800,0000,1167  =0      SUBTEST
U 10A7, 0018,0038,0180,09F0,0000,1234          RC[0E]_K[.8]                   ; INIT THE ADDRESS TO MARK VALID
U 1234, 0003,003C,0180,0A80,0000,10A8          R[0]_0                         ; INIT THE ADDRESS TO MARK INVALID
U 10A8, 0818,0039,4980,0800,0000,1185  =0      D_K[.FF],CALL[DCF]             ; GENERATE MASK FOR TAG BITS
U 10A9, 0001,003C,0180,0980,0000,10AA          RC[0]_D
U 10AA, 0000,003D,0180,0800,0000,1162  =0      ERLOOP
U 10AB, 0000,003C,0180,0A00,0200,1235  LOOPE:  VA_ALU,ALU_R[0]                ; LOAD ADDRESS TO MARK INVALID
U 1235, 0000,003C,0180,9000,0000,1236          CACHE.INVALIDATE               ; MAKE IT INVALID
U 1236, 0010,0038,0180,0970,0200,1237          VA_ALU,ALU_RC[0E]              ; LOAD ADDRESS TO MARK VALID
```

```
U 1237, 0000,003C,0180,9800,0000,1238    ;2418            MCT/VALIDATE                          ; MAKE IT VALID
U 1238, 0010,0038,01C0,0970,0000,1239    ;2419            Q_RC[0E]                              ; GENERATE ADDRESS TO CHECK FOR
U 1239, 0000,003C,01B0,0800,0000,123A    ;2420   LOOPF:   Q_Q.RIGHT                             ; INVALID
U 123A, 0019,2024,5DC0,09E8,0200,123B    ;2421            Q_Q.ANDNOT.K[.7],VA_ALU,RC[0D]_ALU          ; LOAD THE ADDRESS
U 123B, 0000,003C,0180,0800,0084,723C    ;2422            SC_K[.8]                              ; SET BIT FOR PARITY TRAP CATCHER
U 123C, 0003,001C,0180,0AF8,0000,123D    ;2423            R[0F]_NOT.MASK                        ; ...
U 123D, 0000,003C,0180,C800,0000,123E    ;2424            D[LONG]_CACHE.P                       ; REFERANCE THE ADDRESS
U 123E, 0000,003C,79F0,2C00,0000,123F    ;2425            Q_ID[PARITY]                          ; SEE IF CACHE PARITY TRAP OCCURRED
U 123F, 0001,203C,0180,09E0,0000,1240    ;2426            RC[0C]_Q                              ; ...
U 1240, 0000,003C,0180,0A78,0010,1241    ;2427            ALU_R[0F],CLK.UBCC                    ; ...
U 1241, 0000,013C,0180,0800,0000,10AC    ;2428            Z?                                    ; ...
U 10AC, 0000,003C,0180,0800,0000,10AF    ;2429   =0       J/LOOPF1                              ; NO CACHE PARITY TRAP
U 10AD, 0000,003C,0180,0800,0000,10AE    ;2430            NOP
U 10AE, 0000,003D,0180,0800,0000,1165    ;2431   =0       ERROR2                                ; CACHE PARITY TRAP OCCURRED
U 10AF, 0000,003C,75F0,2C00,0000,1242    ;2432   LOOPF1:  Q_ID[MAINT]                           ; READ THE HIT/MISS BITS
U 1242, 001C,0034,01C0,0A38,0010,1243    ;2433            Q_Q.AND.R[7],CLK.UBCC                 ; MASK AND CHECK FOR A MISS
U 1243, 0000,013C,0180,0800,0000,10B0    ;2434            Z?
U 10B0, 0000,003D,0180,0800,0000,1165    ;2435   =0       ERROR2                                ; SHOULD HAVE BEEN A MISS
U 10B1, 0010,0038,01C0,0968,0010,1244    ;2436            Q_RC[0D],CLK.UBCC                     ; MORE ADDRESS TO CHECK?
U 1244, 0000,013C,0180,0800,0000,10B2    ;2437            Z?
U 10B2, 0000,003C,0180,0800,0000,1239    ;2438   =0       J/LOOPF                               ; YES, CONTINUE
U 10B3, 0810,0038,0180,0970,0000,1245    ;2439            D_RC[0E]                              ; GET ADDRESS THAT IS A HIT
U 1245, 0501,003C,0180,0A80,0000,1246    ;2440            R[0]_D,D_D.LEFT                       ; SET NEW ADDRESS TO MAKE A MISS
U 1246, 0811,0034,0180,0900,0010,1247    ;2441            D_D[AND]RC[0],CLK.UBCC                ; DONE YET?
U 1247, 0000,013C,0180,0800,0000,10B4    ;2442            Z?
U 10B4, 0001,003C,0180,09F0,0000,10AB    ;2443   =0       RC[0E]_D,J/LOOPE                      ; CONTINUE
U 10B5, 0000,003C,0180,0800,0000,10B6    ;2444            NOP
                                         ;2445   ;//////////////////////////////////////////////////////////////////
                                         ;2446   ;+
                                         ;2447   ; CHECK THE VALID BIT MEMORY IN GROUP 1
                                         ;2448   ;-
U 10B6, 0000,003D,0180,0800,0000,1167    ;2449   =0       SUBTEST
U 10B7, 0800,003C,8580,0A10,0084,7248    ;2450            D_R[2],SC_K[.C]                       ; GENERATE MAINT REG DATA
U 1248, 0801,001C,0180,0800,0000,1249    ;2451            D_D.ORNOT.MASK
U 1249, 0000,003C,7580,3C00,0000,124A    ;2452            ID[MAINT]_D
U 124A, 0018,0038,0180,09F0,0000,124B    ;2453            RC[0E]_K[.8]                          ; INIT THE ADDRESS TO MARK VALID
U 124B, 0003,003C,0180,0A80,0000,10B8    ;2454            R[0]_0                                ; INIT THE ADDRESS TO MARK INVALID
U 10B8, 0818,0039,4980,0800,0000,1185    ;2455   =0       D_K[.FF],CALL[DCF]                    ; GENERATE MASK FOR TAG BITS
U 10B9, 0001,003C,0180,0980,0000,10BA    ;2456            RC[0]_D
U 10BA, 0000,003D,0180,0800,0000,1162    ;2457   =0       ERLOOP
U 10BB, 0000,003C,0180,0A00,0200,124C    ;2458   LOOPG:   VA_ALU,ALU_R[0]                       ; LOAD ADDRESS TO MARK INVALID
U 124C, 0000,003C,0180,9000,0000,124D    ;2459            CACHE.INVALIDATE                      ; MAKE IT INVALID
U 124D, 0010,0038,0180,0970,0200,124E    ;2460            VA_ALU,ALU_RC[0E]                     ; LOAD ADDRESS TO MARK VALID
U 124E, 0000,003C,0180,9800,0000,124F    ;2461            MCT/VALIDATE                          ; MAKE IT VALID
U 124F, 0010,0038,01C0,0970,0000,1250    ;2462            Q_RC[0E]                              ; GENERATE ADDRESS TO CHECK FOR
U 1250, 0000,003C,01B0,0800,0000,1251    ;2463   LOOPH:   Q_Q.RIGHT                             ; INVALID
U 1251, 0019,2024,5DC0,09E8,0200,1252    ;2464            Q_Q.ANDNOT.K[.7],VA_ALU,RC[0D]_ALU          ; LOAD THE ADDRESS
U 1252, 0000,003C,0180,0800,0084,7253    ;2465            SC_K[.8]                              ; SET BIT FOR PARITY TRAP CATCHER
U 1253, 0003,001C,0180,0AF8,0000,1254    ;2466            R[0F]_NOT.MASK                        ; ...
U 1254, 0000,003C,0180,C800,0000,1255    ;2467            D[LONG]_CACHE.P                       ; REFERANCE THE ADDRESS
U 1255, 0000,003C,79F0,2C00,0000,1256    ;2468            Q_ID[PARITY]
U 1256, 0001,203C,0180,09E0,0000,1257    ;2469            RC[0C]_Q                              ; SEE IF CACHE PARITY TRAP OCCURRED
U 1257, 0000,003C,0180,0A78,0010,1258    ;2470            ALU_R[0F],CLK.UBCC                    ; ...
U 1258, 0000,013C,0180,0800,0000,10BC    ;2471            Z?                                    ; ...
U 10BC, 0000,003C,0180,0800,0000,10BF    ;2472   =0       J/LOOPH1                              ; NO CACHE PARITY TRAP
```

```
U 10BD, 0000,003C,0180,0800,0000,10BE   ;2473           NOP
U 10BE, 0000,003D,0180,0800,0000,1165   ;2474   =0      ERROR2                          ; CACHE PARITY TRAP OCCURRED
U 10BF, 0000,003C,75F0,2C00,0000,1259   ;2475   LOOPH1: Q_ID[MAINT]                     ; READ THE HIT/MISS BITS
U 1259, 001C,0034,01C0,0A38,0010,125A   ;2476           Q_Q.AND.R[7],CLK.UBCC           ; MASK AND CHECK FOR A MISS
U 125A, 0000,013C,0180,0800,0000,10C0   ;2477           Z?
U 10C0, 0000,003D,0180,0800,0000,1165   ;2478   =0      ERROR2                          ; SHOULD HAVE BEEN A MISS
U 10C1, 0010,0038,01C0,0968,0010,125B   ;2479           Q_RC[0D],CLK.UBCC               ; MORE ADDRESS TO CHECK?
U 125B, 0000,013C,0180,0800,0000,10C2   ;2480           Z?
U 10C2, 0000,003C,0180,0800,0000,1250   ;2481   =0      J/LOOPH                         ; YES, CONTINUE
U 10C3, 0810,0038,0180,0970,0000,125C   ;2482           D_RC[0E]                        ; GET ADDRESS THAT IS A HIT
U 125C, 0501,003C,0180,0A80,0000,125D   ;2483           R[0]_D,D_D.LEFT                 ; SET NEW ADDRESS TO MAKE A MISS
U 125D, 0811,0034,0180,0900,0010,125E   ;2484           D_D[AND]RC[0],CLK.UBCC          ; DONE YET?
U 125E, 0000,013C,0180,0800,0000,10C4   ;2485           Z?
U 10C4, 0001,003C,0180,09F0,0000,10BB   ;2486   =0      RC[0E]_D,J/LOOPG                ; CONTINUE
U 10C5, 0000,003C,0180,0800,0000,10C6   ;2487           NOP
```

```
                                        .PAGE  "TEST E1       DUAL ADDRESSING TEST OF CACHE DATA MATRIX"
                                ;*************************************************************************
                                ;++
                                ;
                                ; TEST  E1      DUAL ADDRESSING TEST OF CACHE DATA MATRIX
                                ;
                                ; TEST DESCRIPTION
                                ;
                                ;       THIS TEST PERFORMS A CURSORY CHECK OF THE ADDRESS LINES ON THE
                                ;       CACHE DATA MATRIX. THIS IS DONE WITH THE FOLLOWING SEQUENCE:
                                ;
                                ;       1) WRITE 0 TO ADDRESS 0          3) WRITE 0 TO ADDRESS 8
                                ;          WRITE 1 TO ADDRESS 4             WRITE 1 TO ADDRESS 10
                                ;          CHECK ADDRESS 0 FOR 0            CHECK ADDRESS 8 FOR 0
                                ;                                           CHECK ADDRESS 4 FOR 0
                                ;       2) WRITE 0 TO ADDRESS 4             CHECK ADDRESS 0 FOR 0
                                ;          WRITE 1 TO ADDRESS 8
                                ;          CHECK ADDRESS 4 FOR 0         4) ETC...
                                ;          CHECK ADDRESS 0 FOR 0
                                ;
                                ;       SUBTEST 1 - CHECK GROUP 0
                                ;
                                ;       SUBTEST 2 - CHECK GROUP 1
                                ;
                                ; LOGIC DESCRIPTION
                                ;
                                ;       THIS TEST CHECKS THE ADDRESS LINES TO THE CACHE DATA MATRIX ON
                                ;       THE CDM MODULE.
                                ;
                                ; ERROR DESCRIPTION
                                ;
                                ;       DATA: ADDRESS WRITTEN AS ONE'S
                                ;             ADDRESS BEING CHECKED FOR ZER'S
                                ;             EXPECTED DATA
                                ;             RECEIVED DATA
                                ;             ID[PARITY]
                                ;--
                                ;***************************************************************************
                                =0
U 10C6, 0000,003D,0180,0800,0000,114E    T003:  NEWTST
U 10C7, 001B,0010,1180,09F8,0000,10C8           ALU_0+K[.4]+1,RC[0F]_ALU
U 10C8, 0000,003D,0180,0800,0000,11DA    =0     CALL[,J/REGISTERSETUP               ; SETUP SOME REGISTERS
U 10C9, 0800,003C,0180,0A18,0000,125F           D_R[3]                              ; GET MAINT REG DATA
U 125F, 0000,003C,7580,3C00,0000,10CA           ID[MAINT]_D
                                ;////////////////////////////////////////////////////////////////////////
                                ;+
                                ; CHECK GROUP 0
                                ;-
U 10CA, 0000,003D,0180,0800,0000,1167    =0     SUBTEST
U 10CB, 0018,0038,1180,09F0,0000,1260           RC[0E]_K[.4]                        ; INIT ADDRESS TO WRITE ZERO'S
U 1260, 0003,003C,0180,09E8,0000,10CC           RC[0D]_0                            ; INIT ADDRESS TO WRITE ONE'S
U 10CC, 0818,0039,4980,0800,0000,1185    =0     D_K[.FF],CALL[DCF]                  ; GENERATE MASK FOR TAG BITS
U 10CD, 0001,003C,0180,0980,0000,1261           RC[0]_D
U 1261, 0003,003C,0180,09E0,0000,10CE           RC[0C]_0                            ; SET THE EXPECTED DATA
U 10CE, 0000,003D,0180,0800,0000,1162    =0     ERLOOP
```

```
U 10CF, 0F10,0038,0180,0968,0200,1262   ;2543   LOOPI:   VA_ALU,ALU_RC[0D],D_0             ; SET ADDRESS TO WRITE ZERO'S
U 1262, 0000,003C,0180,9800,0000,1263   ;2544            MCT/VALIDATE                      ; WRITE THE ZERO'S
U 1263, 0010,0038,0180,0970,0200,1264   ;2545            VA_ALU,ALU_RC[0E]                 ; SET ADDRESS TO WRITE ONE'S
U 1264, 081B,0000,0580,0800,0000,1265   ;2546            D_0-K[.1]                         ; GENERATE DATA TO WRITE
U 1265, 0000,003C,0180,9800,0000,1266   ;2547            MCT/VALIDATE                      ; WRITE THE ONE'S
U 1266, 0010,0038,01C0,0970,0000,1267   ;2548            Q_RC[0E]                          ; GENERATE ADDRESS TO CHECK FOR ZERO'S
U 1267, 0000,003C,0180,0800,0084,7268   ;2549   LOOPJ:   SC_K[.8]                          ; SET BIT FOR PARITY TRAP CATCHER
U 1268, 0003,001C,0180,0AF8,0000,1269   ;2550            R[0F]_NOT.MASK                    ; ...
U 1269, 0000,003C,01B0,0800,0000,126A   ;2551            Q_Q.RIGHT                         ; ...
U 126A, 0019,2024,0DC0,0800,0200,126B   ;2552            Q_Q.ANDNOT.K[.3],VA_ALU           ; LOAD THE ADDRESS
U 126B, 0001,203C,0180,C9E8,0000,126C   ;2553            D[LONG]_CACHE.P,RC[0D]_Q          ; READ THE ADDRESS
U 126C, 0000,003C,79F0,2C00,0000,126D   ;2554            Q_ID[PARITY]
U 126D, 0001,203C,0180,09D0,0000,126E   ;2555            RC[0A]_Q                          ; SEE IF CACHE PARITY TRAP OCCURRED
U 126E, 0000,003C,0180,0A78,0010,126F   ;2556            ALU_R[0F],CLK.UBCC                ; ...
U 126F, 0000,013C,0180,0800,0000,10D0   ;2557            Z?                                ; ...
U 10D0, 0000,003C,0180,0800,0000,10D3   ;2558   =0       J/LOOPJ1                          ; NO CACHE PARITY TRAP OCCURRED
U 10D1, 0000,003C,0180,0800,0000,10D2   ;2559            NOP
U 10D2, 0000,003D,0180,0800,0000,1165   ;2560   =0       ERROR2                            ; A CACHE PARITY TRAP OCCURRED
U 10D3, 0001,003C,0180,0800,0010,1270   ;2561   LOOPJ1:  ALU_D,CLK.UBCC                    ; CHECK THAT DATA WAS ZERO
U 1270, 0000,013C,0180,0800,0000,10D4   ;2562            Z?
U 10D4, 0001,003D,0180,09D8,0000,1165   ;2563   =0       ERROR2,RC[0B]_D                   ; RECEIVED DATA INCORRECT
U 10D5, 0010,0038,01C0,0968,0010,1271   ;2564            Q_RC[0D],CLK.UBCC                 ; DONE CHECKING ADDRESSES?
U 1271, 0000,013C,0180,0800,0000,10D6   ;2565            Z?
U 10D6, 0000,003C,0180,0800,0000,1267   ;2566   =0       J/LOOPJ                           ; NO, CONTINUE
U 10D7, 0810,0038,0180,0970,0000,1272   ;2567            D_RC[0E]                          ; GET ADDRESS TO WRITE ONE'S
U 1272, 0501,003C,0180,09E8,0000,1273   ;2568            RC[0D]_D,D_D.LEFT                 ; SET NEW ADDRESS TO WRITE ZER'S
U 1273, 0811,0034,0180,0900,0010,1274   ;2569            D_D[AND]RC[0],CLK.UBCC            ; DONE WITH TEST?
U 1274, 0000,013C,0180,0800,0000,10D8   ;2570            Z?
U 10D8, 0001,003C,0180,09F0,0000,10CF   ;2571   =0       RC[0E]_D,J/LOOPI
U 10D9, 0000,003C,0180,0800,0000,10DA   ;2572            NOP
                                        ;2573   ;/////////////////////////////////////////////////////////////////
                                        ;2574   ;+
                                        ;2575   ; CHECK GROUP 1
                                        ;2576   ;-
U 10DA, 0000,003D,0180,0800,0000,1167   ;2577   =0       SUBTEST
U 10DB, 0800,003C,8580,0A10,0084,7275   ;2578            D_R[2],SC_K[.C]                   ; GET MAINT REG DATA
U 1275, 0801,001C,0180,0800,0000,1276   ;2579            D_D.ORNOT.MASK                    ; FORCE REPLACE G1
U 1276, 0000,003C,7580,3C00,0000,1277   ;2580            ID[MAINT]_D
U 1277, 0018,0038,1180,09F0,0000,1278   ;2581            RC[0E]_K[.4]                      ; INIT ADDRESS TO WRITE ZERO'S
U 1278, 0003,003C,0180,09E8,0000,10DC   ;2582            RC[0D]_0                          ; INIT ADDRESS TO WRITE ONE'S
U 10DC, 0000,003D,0180,0800,0000,1162   ;2583   =0       ERLOOP
U 10DD, 0F10,0038,0180,0968,0200,1279   ;2584   LOOPK:   VA_ALU,ALU_RC[0D],D_0             ; SET ADDRESS TO WRITE ZERO'S
U 1279, 0000,003C,0180,9800,0000,127A   ;2585            MCT/VALIDATE                      ; WRITE THE ZERO'S
U 127A, 0010,0038,0180,0970,0200,127B   ;2586            VA_ALU,ALU_RC[0E]                 ; SET ADDRESS TO WRITE ONE'S
U 127B, 081B,0000,0580,0800,0000,127C   ;2587            D_0-K[.1]                         ; GENERATE DATA TO WRITE
U 127C, 0000,003C,0180,9800,0000,127D   ;2588            MCT/VALIDATE                      ; WRITE THE ONE'S
U 127D, 0010,0038,01C0,0970,0000,127E   ;2589            Q_RC[0E]                          ; GENERATE ADDRESS TO CHECK FOR ZERO'S
U 127E, 0000,003C,0180,0800,0084,727F   ;2590   LOOPL:   SC_K[.8]                          ; SET BIT FOR PARITY TRAP CATCHER
U 127F, 0003,001C,0180,0AF8,0000,1280   ;2591            R[0F]_NOT.MASK                    ; IN R[0F]
U 1280, 0000,003C,01B0,0800,0000,1281   ;2592            Q_Q.RIGHT                         ; ...
U 1281, 0019,2024,0DC0,0800,0200,1282   ;2593            Q_Q.ANDNOT.K[.3],VA_ALU           ; LOAD THE ADDRESS
U 1282, 0001,203C,0180,C9E8,0000,1283   ;2594            D[LONG]_CACHE.P,RC[0D]_Q          ; READ THE ADDRESS
U 1283, 0000,003C,79F0,2C00,0000,1284   ;2595            Q_ID[PARITY]
U 1284, 0001,203C,0180,09D0,0000,1285   ;2596            RC[0A]_Q                          ; SEE IF CACHE PARITY TRAP OCCURRED
U 1285, 0000,003C,0180,0A78,0010,1286   ;2597            ALU_R[0F],CLK.UBCC                ; ...
```

```
U 1286, 0000,013C,0180,0800,0000,10DE   ;2598                   Z?                              ; ...
U 10DE, 0000,003C,0180,0800,0000,10E1   ;2599   =0              J/LOOPL1                        ; NO CACHE PARITY TRAP OCCURRED
U 10DF, 0000,003C,0180,0800,0000,10E0   ;2600                   NOP
U 10E0, 0000,003D,0180,0800,0000,1165   ;2601   =0              ERROR2                          ; A CACHE PARITY TRAP OCCURRED
U 10E1, 0001,003C,0180,0800,0010,1287   ;2602   LOOPL1:         ALU_D,CLK.UBCC                  ; CHECK THAT DATA WAS ZERO
U 1287, 0000,013C,0180,0800,0000,10E2   ;2603                   Z?
U 10E2, 0001,003D,0180,09D8,0000,1165   ;2604   =0              ERROR2,RC[OB]_D                 ; RECEIVED DATA INCORRECT
U 10E3, 0010,0038,01C0,0968,0010,1288   ;2605                   Q_RC[OD],CLK.UBCC               ; DONE CHECKING ADDRESSES?
U 1288, 0000,013C,0180,0800,0000,10E4   ;2606                   Z?
U 10E4, 0000,003C,0180,0800,0000,127E   ;2607   =0              J/LOOPL                         ; NO, CONTINUE
U 10E5, 0810,0038,0180,0970,0000,1289   ;2608                   D_RC[OE]                        ; GET ADDRESS TO WRITE ONE'S
U 1289, 0501,003C,0180,09E8,0000,128A   ;2609                   RC[OD]_D,D_D.LEFT               ; SET NEW ADDRESS TO WRITE ZER'S
U 128A, 0811,0034,0180,0900,0010,128B   ;2610                   D_D[AND]RC[O],CLK.UBCC          ; DONE WITH TEST?
U 128B, 0000,013C,0180,0800,0000,10E6   ;2611                   Z?
U 10E6, 0001,003C,0180,09F0,0000,10DD   ;2612   =0              RC[OE]_D,J/LOOPK
U 10E7, 0000,003C,0180,0800,0000,10E8   ;2613                   NOP
```

```
                                                  .PAGE   "TEST E2       CACHE PARITY MICRO TRAP ENABLE VS MCT FUNCTION"
                                          ;*********************************************************************
                                          ;++
                                          ;
                                          ; TEST  E2      CACHE PARITY MICRO TRAP ENABLE VS MCT FUNCTION
                                          ;
                                          ; TEST DESCRIPTION
                                          ;
                                          ;       THIS TEST CHECKS THAT THE MCT FUNCTIONS ENABLE/DISABLE THE
                                          ;       CACHE PARITY MICRO TRAP. THIS IS DONE BY FORCING A PARITY ERROR
                                          ;       IN THE ADDRESS MATRIX WHILE EXECUTING THE MCT FUNCTION. THE MICRO
                                          ;       TRAP FLAG (R[OF]) IS CHECKED TO DETERMINE IF THE TRAP OCCURRED.
                                          ;
                                          ;       SUBTEST 1 - CHECK THOSE FUNCTIONS THAT SHOULD MICRO TRAP.
                                          ;
                                          ;       SUBTEST 2 - CHECK THOSE FUNCTIONS THAT SHOULD NOT MICRO TRAP.
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;
                                          ;       THIS TEST CHECKS THE CONTENTS OF THE MCT FIELD DECODE ROMS ON
                                          ;       THE SBL MODULE FOR THE "U CP READ" SIGNAL.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;
                                          ;       DATA: EXPECTED MICRO TRAP FLAG
                                          ;             RECEIVED MICRO TRAP FLAG
                                          ;             FUNCTION INDEX (INDICATES WHICH FUNCTION WAS BEING EXECUTED)
                                          ;
                                          ;       TO DETERMINE THE FUNCTION BEING EXECUTED, LOOK IN THE APPROPRIATE
                                          ;       FUNCTION TABLE AT THE END OF THE TEST, USING THE FUNCTION INDEX
                                          ;       TO INDEX THRU THE TABLE.
                                          ;--
                                          ;*********************************************************************
                                          =0
U 10E8, 0000,003D,0180,0800,0000,114E     T00A:   NEWTST
U 10E9, 0018,0038,0D80,09F8,0000,128C             RC[OF]_K[.3]
U 128C, 0818,0038,8980,0800,0000,128D             D_K[.D]                         ; GENERATE DATA FOR MAINT REG
U 128D, 0000,003C,85F8,0800,0084,728E             SC_K[.C],Q_0                    ; FORCE MISS G1 AND FORCE REPLACE GO
U 128E, 0D00,003C,0180,0800,0000,128F             D_DAL.SC
U 128F, 0000,003C,7580,3C00,0000,1290             ID[MAINT]_D                     ; ALSO SBI DISABLE
U 1290, 0818,0038,0580,0800,0000,1291             D_K[.1]
U 1291, 0D00,003C,1180,0800,0084,9292             D_DAL.SC,SC_SC+K[.4]            ; GENERATE ADDRESS TO WRITE = 1000
U 1292, 0819,003C,4180,0800,0000,1293             D_D.OR.K[.80]
U 1293, 0001,003C,0180,0A80,0000,1294             R[0]_D
U 1294, 0818,0038,0180,0800,0000,1295             D_K[.8]
U 1295, 0D00,003C,0180,0800,0000,1296             D_DAL.SC                        ; GENERATE THE FORCE PARITY ERROR
U 1296, 0001,003C,0180,0A88,0000,1297             R[1]_D                          ; BITS
U 1297, 0F00,003C,0180,0A00,0200,1298             VA_A[U,ALU_R[0],D_0             ; LOAD THE VA
U 1298, 0000,003C,0180,9800,0000,10EA             MCT/VALIDATE                    ; WRITE THE DATA MATRIX
                                          ;+
                                          ; CHECK THOSE FUNCTIONS THAT SHOULD MICRO TRAP
                                          ;-
U 10EA, 0000,003D,0180,0800,0000,1167     =0      SUBTEST
U 10EB, 0018,0038,5D80,09E0,0000,1299             RC[OC]_K[.7]                    ; SET THE FUNCTION INDEX
U 1299, 0003,003C,0180,09F0,0000,10EC             RC[OE]_0                        ; SET THE EXPECTED TRAP FLAG
```

```
U 10EC, 0000,003D,0180,0800,0000,1162   ;2669   =0      ERLOOP
                                         ;2670   MCTLOOP:
U 10ED, 0000,003C,0180,0800,0084,729A   ;2671           SC_K[.8]
U 129A, 0003,001C,0180,0AF8,0000,129B   ;2672           R[0F]_NOT.MASK                  ; SET THE TRAP FLAG
U 129B, 0000,003C,0180,0A00,0200,129C   ;2673           VA_ALU,ALU_R[0]                 ; LOAD THE VA
U 129C, 0800,003C,75F0,2E08,0000,129D   ;2674           D_R[1],Q_ID[MAINT]              ; SET THE PARITY REVERSE BIT
U 129D, 081D,0030,0180,0800,0000,129E   ;2675           D_D.OR.Q
U 129E, 0810,0038,7580,3D60,0000,10EE   ;2676           ID[MAINT]_D,D_RC[0C]            ; GET THE FUNCTION INDEX
U 10EE, 0000,193D,0180,0800,0000,1030   ;2677   =0      D3-0?,CALL,J/EXPTRAP            ; GO EXECUTE THE FUNCTION
U 10EF, 0800,003C,0180,0A78,0010,129F   ;2678           D_R[0F],CLK.UBCC                ; CHECK THAT THE TRAP OCCURRED
U 129F, 0000,013C,0180,0800,0000,10F0   ;2679           Z?
U 10F0, 0001,003D,0180,09E8,0000,1165   ;2680   =0      ERROR2,RC[0D]_D                 ; NO MICRO TRAP
U 10F1, 0810,0038,0180,0960,0000,12A0   ;2681           D_RC[0C]                        ; GET FUNCTION INDEX
U 12A0, 0019,0000,0580,09E0,0010,12A1   ;2682           RC[0C]_D-K[.1],CLK.UBCC         ; DONE YET?
U 12A1, 0000,1B3C,0180,0800,0000,1007   ;2683           ALU.N?
U 1007, 0000,003C,0180,0800,0000,10ED   ;2684   =0111   J/MCTLOOP                       ; NO, CONTINUE
U 100F, 0000,003C,0180,0800,0000,10F2   ;2685           NOP
                                         ;2686   ;//////////////////////////////////////////////////////////////////////////////
                                         ;2687   ;+
                                         ;2688   ; CHECK THOSE FUNCTIONS THAT SHOULD NOT MICRO TRAP
                                         ;2689   ;-
U 10F2, 0000,003D,0180,0800,0000,1167   ;2690   =0      SUBTEST
U 10F3, 0018,0038,6180,09E0,0000,12A2   ;2691           RC[0C]_K[.F]                    ; SET THE FUNCTION INDEX
U 12A2, 0000,003C,0180,0800,0084,72A3   ;2692           SC_K[.8]
U 12A3, 0003,001C,0180,09F0,0000,10F4   ;2693           RC[0E]_NOT.MASK                 ; SET THE EXPECTED TRAP FLAG
U 10F4, 0000,003D,0180,0800,0000,1162   ;2694   =0      ERLOOP
                                         ;2695   MCTLOOPB:
U 10F5, 0000,003C,0180,0800,0084,72A4   ;2696           SC_K[.8]
U 12A4, 0003,001C,0180,0AF8,0000,12A5   ;2697           R[0F]_NOT.MASK                  ; SET THE TRAP FLAG
U 12A5, 0000,003C,0180,0A00,0200,12A6   ;2698           VA_ALU,ALU_R[0]                 ; LOAD THE ADDRESS
U 12A6, 0800,003C,75F0,2E08,0000,12A7   ;2699           D_R[1],Q_ID[MAINT]              ; LOAD THE MAINT REG TO FORCE
U 12A7, 081D,0030,0180,0800,0000,12A8   ;2700           D_D.OR.Q
U 12A8, 0810,0038,7580,3D60,0000,10F6   ;2701           ID[MAINT]_D,D_RC[0C]            ; THE PARITY ERROR
U 10F6, 0000,193D,0180,0800,0000,1020   ;2702   =0      D3-0?,CALL,J/NOTRAP             ; GO EXECUTE THE FUNCTION
U 10F7, 0800,003C,0180,0A78,0010,12A9   ;2703           D_R[0F],CLK.UBCC                ; DID A TRAP OCCUR?
U 12A9, 0000,013C,0180,0800,0000,10F8   ;2704           Z?
U 10F8, 0000,003C,0180,0800,0000,10FB   ;2705   =0      J/MCTOK                         ; NO, OK
U 10F9, 0000,003C,0180,0800,0000,10FA   ;2706           NOP
U 10FA, 0001,003D,0180,09E8,0000,1165   ;2707   =0      ERROR2,RC[0D]_D                 ; MICRO TRAP OCCURRED
U 10FB, 0810,0038,0180,0960,0000,12AB   ;2708   MCTOK:  D_RC[0C]                        ; GET THE FUNCTION INDEX
U 12AB, 0019,0000,0580,09E0,0010,12AC   ;2709           RC[0C]_D-K[.1],CLK.UBCC         ; DONE YET?
U 12AC, 0000,1B3C,0180,0800,0000,1017   ;2710           ALU.N?
U 1017, 0000,003C,0180,0800,0000,10F5   ;2711   =0111   J/MCTLOOPB                      ; NO, CONTINUE
U 101F, 0000,003C,0180,0800,0000,12AD   ;2712           J/ENDT00A                       ; DONE WITH TEST
                                         ;2713   ;+
                                         ;2714   ; THE FOLLOWING TABLE ARE THE FUNCTIONS THAT SHOULD MICRO TRAP.
                                         ;2715   ;-
                                         ;2716   =000
                                         ;2717   EXPTRAP:
U 1030, 0000,003E,0180,4000,0000,0001   ;2718           MCT/READ.V.RCHK,RETURN1
U 1031, 0000,003E,0180,4800,0000,0001   ;2719           MCT/READ.V.NOCHK,RETURN1
U 1032, 0000,003E,0180,5000,0000,0001   ;2720           MCT/READ.V.WCHK,RETURN1
U 1033, 0000,003E,0180,5800,0000,0001   ;2721           MCT/READ.V.IBCHK,RETURN1
U 1034, 0000,003E,0180,6800,0000,0001   ;2722           MCT/LOCKREAD.V.NOCHK,RETURN1
U 1035, 0000,003E,0180,7000,0000,0001   ;2723           MCT/LOCKREAD.V.WCHK,RETURN1
```

```
U 1036, 0000,003E,0180,C800,0000,0001    ;2724              MCT/READ.P,RETURN1
U 1037, 0000,003E,0180,E800,0000,0001    ;2725              MCT/LOCKREAD.P,RETURN1
                                         ;2726      ;+
                                         ;2727      ; THE FOLLOWING TABLE ARE THOSE FUNCTIONS THAT SHOULD NOT TRAP.
                                         ;2728      ;-
                                         ;2729      =0000
                                         ;2730      NOTRAP:
U 1020, 0000,003E,0180,0000,0000,0001    ;2731              MCT/TEST.RCHK,RETURN1
U 1021, 0000,003E,0180,1000,0000,0001    ;2732              MCT/TEST.WCHK,RETURN1
U 1022, 0000,003E,0180,2800,0000,0001    ;2733              MCT/WRITE.V.NOCHK,RETURN1
U 1023, 0000,003E,0180,3000,0000,0001    ;2734              MCT/WRITE.V.WCHK,RETURN1
U 1024, 0000,003E,0180,3800,0000,0001    ;2735              MCT/LOCKWRITE.V.XCHK,RETURN1
U 1025, 0000,003E,0180,6000,0000,0001    ;2736              MCT/READ.V.NEWPC,RETURN1
U 1026, 0000,003E,0180,8000,0000,0001    ;2737              MCT/SBI.HOLD,RETURN1
U 1027, 0000,003E,0180,8800,0000,0001    ;2738              MCT/SBI.HOLD+UNJAM,RETURN1
U 1028, 0000,003E,0180,9000,0000,0001    ;2739              MCT/INVALIDATE,RETURN1
U 1029, 0000,003E,0180,9800,0000,0001    ;2740              MCT/VALIDATE,RETURN1
U 102A, 0000,003E,0180,A000,0000,0001    ;2741              MCT/EXTWRITE.P,RETURN1
U 102B, 0000,003E,0180,A800,0000,0001    ;2742              MCT/WRITE.P,RETURN1
U 102C, 0000,003E,0180,B800,0000,0001    ;2743              MCT/LOCKWRITE.P,RETURN1
U 102D, 0000,003E,0180,D800,0000,0001    ;2744              MCT/READ.INT.SUM,RETURN1
U 102E, 0000,003E,0180,F800,0000,0001    ;2745              MCT/ALLOW.IB.READ,RETURN1
U 102F, 0000,003E,0180,0800,0000,0001    ;2746              MCT/MEM.NOP,RETURN1
U 12AD, 0000,003C,8580,0A00,0284,72AE    ;2747      ENDT00A:SC_K[.C],VA_ALU,ALU_R[0]        ; CLEAR THE PARITY ERROR
U 12AE, 0803,001C,0180,0800,0000,12AF    ;2748              D_NOT.MASK
U 12AF, 0F00,003C,7580,3C00,0000,12B0    ;2749              ID[MAINT]_D,D_0
U 12B0, 0000,003C,0180,9800,0000,10FC    ;2750              MCT/VALIDATE
```

```
                                                 .PAGE   "TEST E3       MOVING INVERSIONS TEST OF GROUP 0'S DATA MEMORY"
                                         ;*******************************************************************
                                         ;++
                                         ; TEST  E3      MOVING INVERSIONS TEST OF GROUP 0'S DATA MEMORY
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS IS A MOVING INVERSIONS TEST OF THE CACHE GROUP
                                         ;       0'S DATA MEMORY.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                         ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                         ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                         ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                         ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                         ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                         ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                         ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                         ;       REGISTER ON THE SBI CONTROL MODULE.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       VA REFERENCED
                                         ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                         ;               ONLY THE HIT AND MISS BITS ARE RELEVANT)
                                         ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                         ;               UTRAP OCCURS
                                         ;       GOT CACHE MAINT REGISTER
                                         ;       EXPECTED READ DATA
                                         ;       GOT READ DATA
                                         ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                         ;               FLAG            UTRAP TYPE
                                         ;               ----            ----------
                                         ;               1DE             NO UTRAP OCCURRED
                                         ;               DE              CACHE PARITY UTRAP
                                         ;               15E             TB PARITY ERROR
                                         ;               19E             TB MISS
                                         ;               1CE             TB PROTECTION ERROR
                                         ;               1D6             TB MODIFY BIT ERROR
                                         ;               1DA             X PAGE UTRAP
                                         ;               1DC             UNALIGNED DATA UTRAP
                                         ;
                                         ;--
                                         ;*******************************************************************
                                         =0
U 10FC, 0000,003D,0180,0800,0000,114E    MIDGO:  NEWTST
U 10FD, 0F00,003C,0180,0800,0000,10FE            D_0
U 10FE, 0000,003D,4980,3C00,0000,11AD    =0      ID[TBER0]_D,CALL,J/SOFF ; TBAND SBI CYCLES OFF
U 10FF, 0818,0038,8180,0AA0,0000,12B1            D_K[.3FF],R[4]_K[.3FF]  ; INITIALIZE SOME COUNTERS.
U 12B1, 0100,003C,0180,0800,0000,12B2            D_D.LEFT2,SI/ZERO
U 12B2, 0001,003C,0180,0A98,0000,12B3            R[3]_D
U 12B3, 0001,003C,0180,0AB8,0000,110A            R[7]_D
U 110A, 0F00,003D,0180,0800,0000,116C    =0      D_0,CALL,J/DC.1DE       ; SET UP UTRAP FLAG
U 110B, 0001,003C,0180,0AF0,0000,12B4            R[0E]_D
U 12B4, 0003,003C,0180,0AF8,0000,12B5            R[0F]_0
U 12B5, 0018,0038,D580,09F8,0000,1110            RC[0F]_K[.6]
```

```
                                            ;2806   =0
U 1110, 0000,003D,0180,0800,0000,11AD       ;2807   MIDGOA: CALL,J/SOFF               ; DISABLE SBI CYCLES
U 1111, 0F00,003C,0180,0A38,0200,12B6       ;2808           VA_R[7],D_0               ; INVALIDATE GROUP 1
U 12B6, 0000,003C,0180,9000,0000,1112       ;2809           FS7MCT,MCT/INVALIDATE
U 1112, 0000,003D,0180,0800,0000,11BE       ;2810   =0      CALL,J/ROM1S              ; AND FILL GROUP 0 WITH 0'S
U 1113, 0F00,003C,0180,0800,0000,12B7       ;2811           D_0
U 12B7, 0000,003C,0180,9800,0000,12B8       ;2812           FS/MCT,MCT/VALIDATE
U 12B8, 0000,003C,0180,0A38,0010,12B9       ;2813           ALU_R[7],CLK.UBCC         ; CONTINUE UNTIL ALL LOCATIONS WRITTEN
U 12B9, 0000,013C,0180,0800,0000,1114       ;2814           Z?
U 1114, 0018,0000,1180,0AB8,0000,1110       ;2815   =0      R[7]_LA-K[.4],J/MIDGOA
U 1115, 0018,0038,D980,0A80,0000,12BA       ;2816           R[0]_K[.9]                ; ADDRESS BIT COUNTER
U 12BA, 0018,0038,1180,0A88,0000,12BB       ;2817           R[1]_K[.4]                ; LSB INCREMENT
U 12BB, 0018,0038,1980,0A90,0000,12BC       ;2818           R[2]_K[ZERO]              ; MSB INCREMENT
U 12BC, 0003,003C,0180,0AA8,0000,12BD       ;2819   MIDGOB: R[5]_0                    ; FOREWARD SEQ FLAG
U 12BD, 0003,003C,0180,0AB0,0000,12BE       ;2820           R[6]_0                    ; DATA IS ZERO
U 12BE, 0003,003C,0180,0AB8,0000,12BF       ;2821           R[7]_0                    ; ADDRESS POINTER
U 12BF, 0000,003C,0180,0A20,0000,12C0       ;2822           LAB_R[4]
U 12C0, 0000,003C,0180,0AC0,0000,12C1       ;2823           R[8]_LA                   ; ADDRESS COUNTER
U 12C1, 0000,003C,0180,0A38,0200,12C2       ;2824   MIDGOC: VA_R[7]         ; READ CURRENT ADDRESS
U 12C2, 0000,003C,0180,09F0,0000,1008       ;2825           RC[0E]_LA
U 1008, 0000,003D,0180,0800,0000,105C       ;2826   =00     CALL,J7RHOM1              ; SHOULD BE A HIT IN GROUP 0
U 1009, 0000,003D,0180,0800,0000,1163       ;2827           ERROR1                    ; UNEXPECTED UTRAP OCCURRED
U 100A, 0000,003D,0180,0800,0000,1163       ;2828           ERROR1                    ; HIT/MISS BITS INCORRECT.
U 100B, 0000,003C,01C0,0A30,0000,12C3       ;2829           Q_R[6]                    ; CHECK DATA, EITHER 0 OR FFFFFFFF
U 12C3, 0001,203C,0180,09D8,0000,12C4       ;2830           RC[0B]_Q
U 12C4, 001D,2000,0180,0800,0010,12C5       ;2831           ALU_Q-D,CLK.UBCC
U 12C5, 0000,013C,0180,0800,0000,1116       ;2832           Z?
U 1116, 0000,003D,0180,0800,0000,1163       ;2833   =0      ERROR1                    ; DATA INCORRECT.
U 1117, 0800,0028,0180,0A30,0000,12C6       ;2834           LAB_R[6],ALU_NOT.LA,D_ALU ; WRITE COMPLEMENT DATA
U 12C6, 0001,003C,0180,09D8,0000,1010       ;2835           RC[0B]_D
U 1010, 0000,003D,0180,0800,0000,11A6       ;2836   =00     CALL,J7WRITE              ; WRITE GROUP 0
U 1011, 0000,003D,0180,0800,0000,1163       ;2837           ERROR1                    ; UNEXPECTED UTRAP OCCURRED
U 1012, 0000,003C,0180,0800,0000,1018       ;2838           NOP
                                            ;2839   =
U 1018, 0000,003D,0180,0800,0000,105C       ;2840   =00     CALL,J/RHOM1              ; READ DATA BACK
U 1019, 0000,003D,0180,0800,0000,1163       ;2841           ERROR1                    ; UNEXPECTED UTRAP OCCURRED
U 101A, 0000,003D,0180,0800,0000,1163       ;2842           ERROR1                    ; HIT/MISS BITS INCORRECT.
U 101B, 0010,0038,01C0,0958,0000,12C7       ;2843           Q_RC[0B]                  ; CHECK DATA READ, EITHER FFFFFFFF OR 0
U 12C7, 001D,2000,0180,0800,0010,12C8       ;2844           A[U_Q-D,CLK.UBCC
U 12C8, 0000,013C,0180,0800,0000,1118       ;2845           Z?
U 1118, 0000,003D,0180,0800,0000,1163       ;2846   =0      ERROR1                    ; DATA INCORRECT.
U 1119, 0000,003C,0180,0A40,0010,12C9       ;2847           ALU_R[8],CLK.UBCC
U 12C9, 0000,013C,0180,0800,0000,111A       ;2848           Z?
U 111A, 0018,0000,0580,0AC0,0000,12CA       ;2849   =0      R[8]_LA-K[.1],J/MIDGOD  : SEE IF ALL LOCATIONS HAVE BEEN TESTED.
U 111B, 0000,003C,0180,0800,0000,12D7       ;2850           J/MIDGOF
U 12CA, 0000,003C,0180,0A28,0010,12CB       ;2851   MIDGOD: ALU_R[5],CLK.UBCC         ; IF NOT SEE IF FOREWARD OR BACKWARD SEQUENCE
U 12CB, 0000,013C,0180,0800,0000,111C       ;2852           Z?
U 111C, 0000,003C,0180,0800,0000,12D1       ;2853   =0      J/MIDGOE
                                            ;2854   ; INCREMENT ADDRESS.
U 111D, 0000,003C,01C0,0A08,0000,12CC       ;2855           Q_R[1]                    ; INCREMENT LSB'S
U 12CC, 0800,003C,0180,0A38,0000,12CD       ;2856           D_R[7]
U 12CD, 081D,2014,0180,0800,0000,12CE       ;2857           A[U_Q+D,D_ALU
U 12CE, 000D,0024,0180,0A18,0010,12CF       ;2858           LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
U 12CF, 0000,013C,01C0,0A10,0000,111E       ;2859           Z?,Q_R[2]
U 111E, 081D,2014,0180,0800,0000,111F       ;2860   =0      ALU_Q+D,D_ALU             ; INCREMENT MSB'S
```

```
U 111F, 0000,003C,01C0,0A18,0000,12D0   ;2861            Q_R[3]
U 12D0, 001D,0034,0180,0AB8,0000,12C1   ;2862            A[U_D[AND]Q,R[7]_ALU,J/MIDGOC ; CHECK NEXT LOCATION
                                        ;2863   ; DECREMENT ADDRESS.
U 12D1, 0000,003C,01C0,0A08,0000,12D2   ;2864   MIDGOE: Q_R[1]                  ; DECREMENT LSB'S
U 12D2, 0800,003C,0180,0A38,0000,12D3   ;2865            D_R[7]
U 12D3, 081D,0000,0180,0800,0000,12D4   ;2866            A[U_D-Q,D_ALU
U 12D4, 000D,0024,0180,0A18,0010,12D5   ;2867            LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
U 12D5, 0000,013C,01C0,0A10,0000,1120   ;2868            Z?,Q_R[2]
U 1120, 081D,0000,0180,0800,0000,1121   ;2869   =0       ALU_D-Q,D_ALU          ; DECREMENT MSB'S
U 1121, 0000,003C,01C0,0A18,0000,12D6   ;2870            Q_R[3]
U 12D6, 001D,0034,0180,0AB8,0000,12C1   ;2871            A[U_D[AND]Q,R[7]_ALU,J/MIDGOC ; CHECK NEXT LOCATION
U 12D7, 0000,003C,0180,0A30,0010,12D8   ;2872   MIDGOF: ALU_R[6],CLK.UBCC       ; IS DATA 0
U 12D8, 0000,013C,0180,0800,0000,1122   ;2873            Z?
U 1122, 0000,003C,0180,0800,0000,12DD   ;2874   =0       J/MIDGOH               ; DATA#0
U 1123, 001B,0000,0580,0AB0,0000,12D9   ;2875            ALU_0-K[.1],R[6]_ALU   ; DATA=0
U 12D9, 0800,003C,0180,0A20,0000,12DA   ;2876   MIDGOG: D_R[4]                  ; SET DATA TO FFFFFFFF AND CONTINUE
U 12DA, 0001,003C,0180,0AC0,0000,12DB   ;2877            R[8]_D                 ; IN SAME DIRECTION
U 12DB, 0000,003C,0180,0A28,0010,12DC   ;2878            ALU_R[5],CLK.UBCC
U 12DC, 0800,013C,0180,0A18,0000,1124   ;2879            Z?,D_R[3]
U 1124, 0001,003C,0180,0AB8,0000,12C1   ;2880   =0       R[7]_D,J/MIDGOC
U 1125, 0003,003C,0180,0AB8,0000,12C1   ;2881            R[7]_0,J/MIDGOC
U 12DD, 0000,003C,0180,0A28,0010,12DE   ;2882   MIDGOH: ALU_R[5],CLK.UBCC       ; SEE IF FOREWARD SEQ
U 12DE, 0000,013C,0180,0800,0000,1126   ;2883            Z?
U 1126, 0000,003C,0180,0800,0000,12E0   ;2884   =0       J/MIDGOI
U 1127, 0003,003C,0180,0AB0,0000,12DF   ;2885            R[6]_0                 ; IF FOREWARD SEQUENCE
U 12DF, 001B,0000,0580,0AA8,0000,12D9   ;2886            ALU_0-K[.1],R[5]_ALU,J/MIDGOG ; CHANGE DIRECTION
U 12E0, 0000,003C,0180,0A00,0010,12E1   ;2887   MIDGOI: ALU_R[0],CLK.UBCC       ; IF WAS BACKWARD SEQ THEN SEE
U 12E1, 0000,013C,0180,0800,0000,1128   ;2888            Z?                     ; IF ALL ADDRESS BITS HAVE BEEN USED AS LSB
U 1128, 0018,0000,0580,0A80,0000,12E2   ;2889   =0       R[0]_LA-K[.1],J/MIDGOJ
U 1129, 0000,003C,0180,0800,0000,12E6   ;2890            J/MIDGOK               ; IF YES DONE.
U 12E2, 0800,003C,0180,0A08,0000,12E3   ;2891   MIDGOJ: D_R[1]                  ; IF NOT CHANGE LSB AND CONTINUE
U 12E3, 0500,003C,0180,0800,0000,12E4   ;2892            D_D.LEFT,SI/ZERO
U 12E4, 0001,003C,0180,0A88,0000,12E5   ;2893            R[1]_D
U 12E5, 0018,0038,1180,0A90,0000,12BC   ;2894            R[2]_K[.4],J/MIDGOB
U 12E6, 0000,003C,0180,0800,0000,112A   ;2895   MIDGOK: NOP
```

```
                                               .PAGE   "TEST E4        MOVING INVERSIONS TEST OF GROUP 1'S DATA MEMORY"
                                        ;*****************************************************************
                                        ;++
                                        ; TEST  E4      MOVING INVERSIONS TEST OF GROUP 1'S DATA MEMORY
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A MOVING INVERSIONS TEST OF THE CACHE GROUP
                                        ;       1'S DATA MEMORY.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                        ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       VA REFERENCED
                                        ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                        ;               ONLY THE HIT AND MISS BITS ARE RELEVANT)
                                        ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                        ;               UTRAP OCCURS
                                        ;       GOT CACHE MAINT REGISTER
                                        ;       EXPECTED READ DATA
                                        ;       GOT READ DATA
                                        ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;               FLAG            UTRAP TYPE
                                        ;               ----            ----------
                                        ;               1DE             NO UTRAP OCCURRED
                                        ;               DE              CACHE PARITY UTRAP
                                        ;               15E             TB PARITY ERROR
                                        ;               19E             TB MISS
                                        ;               1CE             TB PROTECTION ERROR
                                        ;               1D6             TB MODIFY BIT ERROR
                                        ;               1DA             X PAGE UTRAP
                                        ;               1DC             UNALIGNED DATA UTRAP
                                        ;
                                        ;--
                                        ;*****************************************************************
                                        =0
U 112A, 0000,003D,0180,0800,0000,114E   MIDG1:  NEWTST
U 112B, 0F00,003C,0180,0800,0000,112C           D_0
U 112C, 0000,003D,4980,3C00,0000,11AD   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 112D, 0818,0038,8180,0AA0,0000,12E7           D_K[.3FF],R[4]_K[.3FF]  ; INITIALIZE SOME COUNTERS
U 12E7, 0100,003C,0180,0800,0000,12E8           D_D.LEFT2,SI/ZERO
U 12E8, 0001,003C,0180,0A98,0000,12E9           R[3]_D
U 12E9, 0001,003C,0180,0AB8,0000,112E           R[7]_D
U 112E, 0F00,003D,0180,0800,0000,116C   =0      D_0,CALL,J/DC.1DE       ; SET UP UTRAP FLAG
U 112F, 0001,003C,0180,0AF0,0000,12EA           R[0E]_D
U 12EA, 0003,003C,0180,0AF8,0000,12EB           R[0F]_0
U 12EB, 0018,0038,D580,09F8,0000,1130           RC[0F]_K[.6]
```

```
                                       ;2951    =0
U 1130, 0000,003D,0180,0800,0000,11AD  ;2952    MIDG1A: CALL,J/SOFF              ; TURN OFF SBI CYCLES
U 1131, 0F00,003C,0180,0A38,0200,12EC  ;2953            VA_R[7],D_0              ; INVALIDATE EVERY LOCATION IN
U 12EC, 0000,003C,0180,9000,0000,1132  ;2954            FS/MCT,MCT/INVALIDATE    ; GROUP 0 AND
U 1132, 0000,003D,0180,0800,0000,11C1  ;2955    =0      CALL,J/R1MOS             ; FILL GROUP 1 UP WITH 0
U 1133, 0F00,003C,0180,0800,0000,12ED  ;2956            D_0
U 12ED, 0000,003C,0180,9800,0000,12EE  ;2957            FS/MCT,MCT/VALIDATE
U 12EE, 0000,003C,0180,0A38,0010,12EF  ;2958            ALU_R[7],CLK.UBCC        ; CONTINUE UNTIL EVERY LOCATIO WRITTEN
U 12EF, 0000,013C,0180,0800,0000,1134  ;2959            Z?
U 1134, 0018,0000,1180,0AB8,0000,1130  ;2960    =0      R[7]_LA-K[.4],J/MIDG1A
U 1135, 0018,0038,D980,0A80,0000,12F0  ;2961            R[0]_K[.9]               ; ADDRESS BIT COUNTER
U 12F0, 0018,0038,1180,0A88,0000,12F1  ;2962            R[1]_K[.4]               ; LSB INCREMENT
U 12F1, 0018,0038,1980,0A90,0000,12F2  ;2963            R[2]_K[ZERO]             ; MSB INCREMENT
U 12F2, 0003,003C,0180,0AA8,0000,12F3  ;2964    MIDG1B: R[5]_0                   ; FOREWARD SEQ FLAG
U 12F3, 0003,003C,0180,0AB0,0000,12F4  ;2965            R[6]_0                   ; DATA IS ZERO
U 12F4, 0003,003C,0180,0AB8,0000,12F5  ;2966            R[7]_0                   ; ADDRESS POINTER
U 12F5, 0000,003C,0180,0A20,0000,12F6  ;2967            LAB_R[4]
U 12F6, 0000,003C,0180,0AC0,0000,12F7  ;2968            R[8]_LA                  ; ADDRESS COUNTER
U 12F7, 0000,003C,0180,0A38,0200,12F8  ;2969    MIDG1C: VA_R[7]         ; READ CURRENT LOCATION
U 12F8, 0000,003C,0180,09F0,0000,1038  ;2970            RC[0E]_LA
U 1038, 0000,003D,0180,0800,0000,1060  ;2971    =00     CALL,J/RMOH1             ; SHOULD BE A HIT IN GROUP 1
U 1039, 0000,003D,0180,0800,0000,1163  ;2972            ERROR1                   ; UNEXPECTED UTRAP OCCURRED
U 103A, 0000,003D,0180,0800,0000,1163  ;2973            ERROR1                   ; HIT/MISS BITS INCORRECT.
U 103B, 0000,003C,01C0,0A30,0000,12F9  ;2974            Q_R[6]                   ; DATA SHOULD BE 0 OR FFFFFFFF
U 12F9, 0001,203C,0180,09D8,0000,12FA  ;2975            RC[0B]_Q
U 12FA, 001D,2000,0180,0800,0010,12FB  ;2976            ALU_Q-D,CLK.UBCC
U 12FB, 0000,013C,0180,0800,0000,1136  ;2977            Z?
U 1136, 0000,003D,0180,0800,0000,1163  ;2978    =0      ERROR1                   ; DATA INCORRECT.
U 1137, 0800,0028,0180,0A30,0000,12FC  ;2979            LAB_R[6],ALU_NOT.LA,D_ALU
U 12FC, 0001,003C,0180,09D8,0000,103C  ;2980            RC[0B]_D                 ; WRITE COMPLEMENT DATA
U 103C, 0000,003D,0180,0800,0000,11A6  ;2981    =00     CALL,J/WRITE             ; WRITE GROUP 1
U 103D, 0000,003D,0180,0800,0000,1163  ;2982            ERROR1                   ; UNEXPECTED UTRAP OCCURRED
U 103E, 0000,003C,0180,0800,0000,1040  ;2983            NOP
                                       ;2984    =
U 1040, 0000,003D,0180,0800,0000,1060  ;2985    =00     CALL,J/RMOH1             ; READ THE DATA BACK
U 1041, 0000,003D,0180,0800,0000,1163  ;2986            ERROR1                   ; UNEXPECTED UTRAP OCCURRED
U 1042, 0000,003D,0180,0800,0000,1163  ;2987            ERROR1                   ; HIT/MISS BITS INCORRECT.
U 1043, 0010,0038,01C0,0958,0000,12FD  ;2988            Q_RC[0B]                 ; SHOULD BE FFFFFFFF OR 0
U 12FD, 001D,2000,0180,0800,0010,12FE  ;2989            ALU_Q-D,CLK.UBCC
U 12FE, 0000,013C,0180,0800,0000,1138  ;2990            Z?
U 1138, 0000,003D,0180,0800,0000,1163  ;2991    =0      ERROR1                   ; DATA INCORRECT.
U 1139, 0000,003C,0180,0A40,0010,12FF  ;2992            ALU_R[8],CLK.UBCC        ; TESTED ALL LOCATIONS?
U 12FF, 0000,013C,0180,0800,0000,113A  ;2993            Z?
U 113A, 0018,0000,0580,0AC0,0000,1300  ;2994    =0      R[8]_LA-K[.1],J/MIDG1D  : IF NOT GO TO NEXT ADDRESS
U 113B, 0000,003C,0180,0800,0000,130D  ;2995            J/MIDG1F
U 1300, 0000,003C,0180,0A28,0010,1301  ;2996    MIDG1D: ALU_R[5],CLK.UBCC        ; SEE IF FOREWARD OR BACKWARD SEQ
U 1301, 0000,013C,0180,0800,0000,113C  ;2997            Z?
U 113C, 0000,003C,0180,0800,0000,1307  ;2998    =0      J/MIDG1E
                                       ;2999    ; INCREMENT ADDRESS.
U 113D, 0000,003C,01C0,0A08,0000,1302  ;3000            Q_R[1]                   ; INCREMENT LSB'S
U 1302, 0800,003C,0180,0A38,0000,1303  ;3001            D_R[7]
U 1303, 081D,2014,0180,0800,0000,1304  ;3002            ALU_Q+D,D_ALU
U 1304, 000D,0024,0180,0A18,0010,1305  ;3003            LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
U 1305, 0000,013C,01C0,0A10,0000,113E  ;3004            Z?,Q_R[2]
U 113E, 081D,2014,0180,0800,0000,113F  ;3005    =0      ALU_Q+D,D_ALU            ; INCREMENT MSB'S
```

```
U 113F, 0000,003C,01C0,0A18,0000,1306   ;3006            Q_R[3]
U 1306, 001D,0034,0180,0AB8,0000,12F7   ;3007            ALU_D[AND]Q,R[7]_ALU,J/MIDG1C ; TEST NEXT LOCATION
                                        ;3008    ; DECREMENT ADDRESS.
U 1307, 0000,003C,01C0,0A08,0000,1308   ;3009    MIDG1E: Q_R[1]                       ; DECREMENT LSB'S
U 1308, 0800,003C,0180,0A38,0000,1309   ;3010            D_R[7]
U 1309, 081D,0000,0180,0800,0000,130A   ;3011            ALU_D-Q,D_ALU
U 130A, 000D,0024,0180,0A18,0010,130B   ;3012            LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
U 130B, 0000,013C,01C0,0A10,0000,1140   ;3013            Z?,Q_R[2]
U 1140, 081D,0000,0180,0800,0000,1141   ;3014    =0      ALU_D-Q,D_ALU                ; DECREMENT MSB'S
U 1141, 0000,003C,01C0,0A18,0000,130C   ;3015            Q_R[3]
U 130C, 001D,0034,0180,0AB8,0000,12F7   ;3016            ALU_D[AND]Q,R[7]_ALU,J/MIDG1C ; TEST NEXT ADDRESS.
U 130D, 0000,003C,0180,0A30,0010,130E   ;3017    MIDG1F: ALU_R[6],CLK.UBCC            ; SEE IF DATA 0 OR FFFFFFFF
U 130E, 0000,013C,0180,0800,0000,1142   ;3018            Z?
U 1142, 0000,003C,0180,0800,0000,1313   ;3019    =0      J/MIDG1H                     ; DATA#0
U 1143, 001B,0000,0580,0AB0,0000,130F   ;3020            ALU_0-K[.1],R[6]_ALU         ; DATA=0
U 130F, 0800,003C,0180,0A20,0000,1310   ;3021    MIDG1G: D_R[4]                       ; IF DATA 0 SET DATA TO FFFFFFFF
U 1310, 0001,003C,0180,0AC0,0000,1311   ;3022            R[8]_D                       ; AND CONTINUE IN THE SAME DIRECTION
U 1311, 0000,003C,0180,0A28,0010,1312   ;3023            ALU_R[5],CLK.UBCC
U 1312, 0800,013C,0180,0A18,0000,1144   ;3024            Z?,D_R[3]
U 1144, 0001,003C,0180,0AB8,0000,12F7   ;3025    =0      R[7]_D,J/MIDG1C
U 1145, 0003,003C,0180,0AB8,0000,12F7   ;3026            R[7]_0,J/MIDG1C
U 1313, 0000,003C,0180,0A28,0010,1314   ;3027    MIDG1H: ALU_R[5],CLK.UBCC            ; IF DATA WAS FFFFFFFF SEE IF FOREWARD
U 1314, 0000,013C,0180,0800,0000,1146   ;3028            Z?                           ; OR BACKWARD SEQ
U 1146, 0000,003C,0180,0800,0000,1316   ;3029    =0      J/MIDG1I
U 1147, 0003,003C,0180,0AB0,0000,1315   ;3030            R[6]_0                       ;; IF FOREWARD SEQ THEN CHANGE DIRECTION
U 1315, 001B,0000,0580,0AA8,0000,130F   ;3031            ALU_0-K[.1],R[5]_ALU,J/MIDG1G
U 1316, 0000,003C,0180,0A00,0010,1317   ;3032    MIDG1I: ALU_R[0],CLK.UBCC            ; SEE IF EACH ADDRESS BIT HAS BEEN USED AS AN LSB
U 1317, 0000,013C,0180,0800,0000,1148   ;3033            Z?
U 1148, 0018,0000,0580,0A80,0000,1318   ;3034    =0      R[0]_LA-K[.1],J/MIDG1J
U 1149, 0000,003C,0180,0800,0000,131C   ;3035            J/MIDG1K                     ; IF YES THEN DONE
U 1318, 0800,003C,0180,0A08,0000,1319   ;3036    MIDG1J: D_R[1]                       ; CHANGE ADDRESS LSB AND CONTINUE
U 1319, 0500,003C,0180,0800,0000,131A   ;3037            D_D.LEFT,SI/ZERO
U 131A, 0001,003C,0180,0A88,0000,131B   ;3038            R[1]_D
U 131B, 0018,0038,1180,0A90,0000,12F2   ;3039            R[2]_K[.4],J/MIDG1B
U 131C, 0000,003C,0180,0800,0000,114A   ;3040    MIDG1K: NOP
                                        ;3041    =0
U 114A, 0000,003D,0180,0800,0000,114E   ;3042    DUMMY1: NEWTST
```

```
;                           Location / Line Number Index

;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000          1871:    1838     1845=    1861=    1862=    1863=    1839     2684=
U 1008          2826=    2827=    2828=    2829=    1952=    1953=    1840     2685=
U 1010          2836=    2837=    2838=    1841     1954=    1955=    1842     2711=
U 1018          2840=    2841=    2842=    2843=    1980=    1981=    1843     2712=
U 1020          2731=    2732=    2733=    2734=    2735=    2736=    2737=    2738=
U 1028          2739=    2740=    2741=    2742=    2743=    2744=    2745=    2746=
U 1030          2718=    2719=    2720=    2721=    2722=    2723=    2724=    2725=
U 1038          2971=    2972=    2973=    2974=    2981=    2982=    2983=    1844
U 1040          2985=    2986=    2987=    2988=    1983=    1984=    1986=    1987=
U 1048          1990=    1991=    1993=    1994=    1996=    1997=    1902:    1864
U 1050          2000=    2001=    2004=    2005=    2022=    2023=    2025=    2026=
U 1058          2035=    2036=    1905:    1865     2038=    2039=    1908:    1866
U 1060          2041=    2042=    2044=    2045=    2059=    2060=    2067=    2068=
U 1068          2081=    2082=    2129=    2130=    2132=    2133=    2137=    2138=
U 1070          2140=    2141=    2152=    2153=    2154=    2155=    2156=    2157=
U 1078          2187=    2188=    2189=    2190=    2252=    2253=    2254=    2255=
U 1080          2262=    2263=    2269=    2270=    2271=    2272=    2287=    2288=
U 1088          2289=    2290=    2293=    2294=    2295=    2296=    2298=    2299=
U 1090          2308=    2309=    2314=    2315=    2324=    2325=    2340=    2341=
U 1098          2342=    2343=    2346=    2347=    2348=    2349=    2351=    2352=
U 10A0          2361=    2362=    2400=    2401=    2402=    2403=    2409=    2410=
U 10A8          2412=    2413=    2414=    2415=    2429=    2430=    2431=    2432=
U 10B0          2435=    2436=    2438=    2439=    2443=    2444=    2449=    2450=
U 10B8          2455=    2456=    2457=    2458=    2472=    2473=    2474=    2475=
U 10C0          2478=    2479=    2481=    2482=    2486=    2487=    2527=    2528=
U 10C8          2529=    2530=    2536=    2537=    2539=    2540=    2542=    2543=
U 10D0          2558=    2559=    2560=    2561=    2563=    2564=    2566=    2567=
U 10D8          2571=    2572=    2577=    2578=    2583=    2584=    2599=    2600=
U 10E0          2601=    2602=    2604=    2605=    2607=    2608=    2612=    2613=
U 10E8          2648=    2649=    2666=    2667=    2669=    2671=    2677=    2678=
U 10F0          2680=    2681=    2690=    2691=    2694=    2696=    2702=    2703=
U 10F8          2705=    2706=    2707=    2708=    2795=    2796=    2797=    2798=
U 1100          1825:    1826:    1827:    1828:    1829:    1830:    1831:    1832:
U 1108          1833:    1867     2802=    2803=    1834:    1835:    1836:    1837:
U 1110          2807=    2808=    2810=    2811=    2815=    2816=    2833=    2834=
U 1118          2846=    2847=    2849=    2850=    2853=    2855=    2860=    2861=
U 1120          2869=    2870=    2874=    2875=    2880=    2881=    2884=    2885=
U 1128          2889=    2890=    2940=    2941=    2942=    2943=    2947=    2948=
U 1130          2952=    2953=    2955=    2956=    2960=    2961=    2978=    2979=
U 1138          2991=    2992=    2994=    2995=    2998=    3000=    3005=    3006=
U 1140          3014=    3015=    3019=    3020=    3025=    3026=    3029=    3030=
U 1148          3034=    3035=    3042=    1868     1869     1870     1880     1881
U 1150          1882     1883     1884     1885     1886     1928:    1887     1888
U 1158          1889     1890     1891     1892     1893     1894     1895     1896
U 1160          1897     1898     1899     1900     1901     1903     1904     1936
U 1168          1937     1943     1944     1945     1950     1951     1957     1958
U 1170          1959     1960     1961     1962     1963     1964     1965     1966
U 1178          1967     1968     1969     1970     2011:    2012:    2013:    2014:
U 1180          1971     1972     1973     1974     1975     1976     1977     1978
U 1188          1982     1988     1992     1998     2002     2006     2010     2020
U 1190          2024     2046     2047     2048     2049     2050     2051     2052
U 1198          2053     2054     2055     2056     2057     2058     2061     2062
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0           2063    2064    2065    2066    2069    2070    2074    2075
U 11A8           2076    2077    2078    2079    2080    2088    2089    2090
U 11B0           2091    2093    2094    2095    2096    2098    2099    2101
U 11B8           2102    2104    2105    2107    2108    2109    2111    2112
U 11C0           2113    2115    2127    2131    2134    2135    2139    2142
U 11C8           2143    2144    2145    2146    2147    2148    2149    2150
U 11D0           2151    2158    2159    2160    2161    2162    2163    2164
U 11D8           2165    2166    2186    2191    2192    2193    2194    2195
U 11E0           2196    2197    2198    2199    2200    2201    2202    2203
U 11E8           2204    2205    2206    2207    2208    2209    2210    2256
U 11F0           2264    2265    2266    2267    2268    2273    2274    2275
U 11F8           2276    2277    2278    2279    2015:   2016:   2017:   2018:
U 1200           2280    2281    2282    2283    2284    2285    2286    2291
U 1208           2292    2297    2300    2301    2302    2303    2304    2305
U 1210           2306    2307    2316    2317    2318    2319    2320    2321
U 1218           2322    2323    2326    2327    2328    2329    2330    2331
U 1220           2332    2333    2334    2335    2336    2337    2338    2339
U 1228           2344    2345    2350    2353    2354    2355    2356    2357
U 1230           2358    2359    2360    2404    2411    2416    2417    2418
U 1238           2419    2420    2421    2422    2423    2424    2425    2426
U 1240           2427    2428    2433    2434    2437    2440    2441    2442
U 1248           2451    2452    2453    2454    2459    2460    2461    2462
U 1250           2463    2464    2465    2466    2467    2468    2469    2470
U 1258           2471    2476    2477    2480    2483    2484    2485    2531
U 1260           2538    2541    2544    2545    2546    2547    2548    2549
U 1268           2550    2551    2552    2553    2554    2555    2556    2557
U 1270           2562    2565    2568    2569    2570    2579    2580    2581
U 1278           2582    2585    2586    2587    2588    2589    2590    2591
U 1280           2592    2593    2594    2595    2596    2597    2598    2603
U 1288           2606    2609    2610    2611    2650    2651    2652    2653
U 1290           2654    2655    2656    2657    2658    2659    2660    2661
U 1298           2662    2668    2672    2673    2674    2675    2676    2679
U 12A0           2682    2683    2692    2693    2697    2698    2699    2700
U 12A8           2701    2704    1929:   2709    2710    2747    2748    2749
U 12B0           2750    2799    2800    2801    2804    2805    2809    2812
U 12B8           2813    2814    2817    2818    2819    2820    2821    2822
U 12C0           2823    2824    2825    2830    2831    2832    2835    2844
U 12C8           2845    2848    2851    2852    2856    2857    2858    2859
U 12D0           2862    2864    2865    2866    2867    2868    2871    2872
U 12D8           2873    2876    2877    2878    2879    2882    2883    2886
U 12E0           2887    2888    2891    2892    2893    2894    2895    2944
U 12E8           2945    2946    2949    2950    2954    2957    2958    2959
U 12F0           2962    2963    2964    2965    2966    2967    2968    2969
U 12F8           2970    2975    2976    2977    2980    2989    2990    2993
U 1300           2996    2997    3001    3002    3003    3004    3007    3009
U 1308           3010    3011    3012    3013    3016    3017    3018    3021
U 1310           3022    3023    3024    3027    3028    3031    3032    3033
U 1318           3036    3037    3038    3039    3040
U 1320 - 13EF Unused
U 13F0           1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8           1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH2F        813

Used             813
Remaining

Total microwords used in memory U: 813
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH2F.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 1806  MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2167  TEST E5 MOVING INVERSIONS TEST OF GROUP 0'S ADDRESS MEMORY
; 2322  TEST E6 MOVING INVERSIONS TEST OF GROUP 1'S ADDRESS MEMORY
; 2477  TEST E7 MDAL TEST 1
; 2635  TEST E8 MDAL TEST 2
; 2767  TEST E9 MDAL TEST 3
; 2870  TEST EA MDAL TEST 4
; 2973  TEST EB BAL TEST 1
```

```
;1      .NOLIST
;1804   .LIST
;1805
```

```
                                                .TOC     'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                         .REGION/1000,13FF
                                         ;+
                                         ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                         ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                         ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                         ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                         ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                         ;
                                         ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                         ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                         ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                         ;       R[OF] AND DO A RETURNO.
                                         ;
                                         ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                         ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                         ; TO THE CONSOLE.
                                         ;
                                         ;-
U 1100, 0000,003C,1980,0800,0084,7003    1100:   SC_K[ZERO],J/TRPH1        ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001    1101:   SC_K[.1],J/TRPHO          ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001    1102:   SC_K[.2],J/TRPHO          ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001    1103:   SC_K[.3],J/TRPHO          ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001    1104:   SC_K[.4],J/TRPHO          ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001    1105:   SC_K[.6],J/TRPHO          ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001    1106:   SC_K[.9],J/TRPHO          ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001    1107:   SC_K[.7],J/TRPHO          ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001    1108:   SC_K[.8],J/TRPHO          ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003    110C:   SC_K[.C],J/TRPH1          ; RDS
U 110D, 0000,003C,8980,0800,0084,7003    110D:   SC_K[.D],J/TRPH1          ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001    110E:   SC_K[.10],J/TRPHO         ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003    110F:   SC_K[.F],J/TRPH1          ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,104F    TRPHO:  Q_ID[USTACK]
U 104F, 0C00,003C,01E0,0800,0000,105B            Q_D,D_Q
U 105B, 0000,003C,8180,3C00,0000,105F            ID[USTACK]_D
U 105F, 0C00,003C,01E0,0800,0000,1109            Q_D,D_Q
U 1109, 0000,003C,01C0,0A78,0000,111B            Q_R[OF]
U 111B, 0001,2024,0180,0800,0010,111C            A[U_Q.ANDNOT.MASK,CLK.UBCC       ; WAS TRAP EXPECTED?
U 111C, 0000,013C,0180,0800,0000,1002            Z?                               ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000    =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN
                                         ;+
                                         ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                         ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                         ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                         ;
                                         ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                         ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                         ;             FAULT STATUS REGISTER
                                         ;             SBI ERROR REGISTER
                                         ;             TIMEOUT ADDRESS REGISTER
                                         ;             MAINTENANCE REGISTER
                                         ;             CACHE PARITY REGISTER
                                         ;             TB ERROR REGISTER 1
                                         ;             TB ERROR REGISTER 0
                                         ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,1014   ;1861   TRPH1:  RC[0D]_SC
U 1014, 0000,003D,D980,0800,0084,713E   ;1862   =0      SETRCF[.9]
U 1015, 0000,003C,49F0,2C00,0000,111D   ;1863           Q_ID[TBER0]
U 111D, 0001,203C,4DF0,2DB0,0000,111E   ;1864           RC[6]_Q,Q_ID[TBER1]
U 111E, 0001,203C,65F0,2DB8,0000,111F   ;1865           RC[7]_Q,Q_ID[SBI.ERR]
U 111F, 0001,203C,6DF0,2DD8,0000,1120   ;1866           RC[0B]_Q,Q_ID[FAULT]
U 1120, 0001,203C,75F0,2DE0,0000,1121   ;1867           RC[0C]_Q,Q_ID[MAINT]
U 1121, 0001,203C,79F0,2DC8,0000,1122   ;1868           RC[9]_Q,Q_ID[PARITY]
U 1122, 0001,203C,69F0,2DC0,0000,1123   ;1869           RC[8]_Q,Q_ID[TIME.ADDR]
U 1123, 0001,203C,81F0,2DD0,0000,1000   ;1870           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1138   ;1871   1000:   RC[0E]_Q,ERROR1
                                        ;1872   ;+
                                        ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1875   ;               NEWTST
                                        ;1876   ;               ERLOOP
                                        ;1877   ;               ERROR1
                                        ;1878   ;               ERROR2
                                        ;1879   ;
U 1124, 0000,003C,65F8,0800,0084,7125   ;1880   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 1125, 0818,0038,8D80,0800,0000,1126   ;1881           D_K[.1F]                        ; ...
U 1126, 0D00,003C,0180,0800,0000,1127   ;1882           D_DAL.SC
U 1127, 0000,003C,3D80,3C00,0000,1128   ;1883           ID[PSL]_D                       ; WRITE THE PSL
U 1128, 0818,0038,0580,0800,0000,1129   ;1884           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 1129, 0D00,003C,0180,0800,0000,112A   ;1885           D_DAL.SC
U 112A, 0F00,003C,3180,3C00,0000,112B   ;1886           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 112B, 0000,003C,5D80,3C00,0000,112C   ;1887           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 112C, 0000,003C,3980,3C00,0000,112D   ;1888           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 112D, 0000,003C,2980,3C00,0000,112E   ;1889           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 112E, 0000,003C,4980,3C00,0000,112F   ;1890           ID[TBER0]_D                     ; SHUT OFF THE TB
U 112F, 0818,0038,C180,0800,0000,1130   ;1891           D_K[.FFFF]
U 1130, 0000,003C,6580,3C00,0000,1131   ;1892           ID[SBI.ERR]_D
U 1131, 0F00,003C,6D80,3C00,0000,1132   ;1893           ID[FAULT]_D,D_0
U 1132, 0000,003C,6D80,3C00,0000,1133   ;1894           ID[FAULT]_D
U 1133, 0000,003C,6580,3C00,0000,1134   ;1895           ID[SBI.ERR]_D
U 1134, 0003,003C,0180,09F0,0000,1135   ;1896           RC[0E]_0
U 1135, 0003,003C,0180,0AF8,0000,1136   ;1897           R[0F]_0
U 1136, 0003,003C,0180,09E8,0000,105E   ;1898           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 1137, 0818,0038,0980,0800,0000,105E   ;1899   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 1138, 0810,0038,0180,0978,0000,1139   ;1900   ERROR1: D_RC[0F]
U 1139, 0819,0034,4D80,0800,0000,104E   ;1901           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1902   104E:   D_D.OR.K[.4],J/CALLCON
U 113A, 0810,0038,0180,0978,0000,113B   ;1903   ERROR2: D_RC[0F]
U 113B, 0819,0034,4D80,0800,0000,105A   ;1904           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1905   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1906   105E:
                                        ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1908           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1909   ;+
                                        ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1912   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1913   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1914   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1915   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,113C   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 113C, 0810,0038,4D80,0978,0000,113D   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 113D, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 113E, 0010,0038,01C0,0978,0000,113F   ;1943   SETRCF: Q_RC[OF]
U 113F, 0019,2034,4DC0,0800,0000,1140   ;1944           Q_Q.AND.K[.FF00]
U 1140, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946
                                        ;1947   ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                        ;1948   ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                        ;1949   ; CERTAIN TRAPS.
U 1141, 0018,0038,C180,0800,0000,1142   ;1950   DC.1DE: ALU_K[.FFFF]
U 1142, 0500,003C,0380,0800,0000,1016   ;1951           D_D.LEFT,SI/7
U 1016, 0000,003D,0180,0800,0000,1154   ;1952   =0      CALL,J/DCD
U 1017, 0000,003C,0180,0800,0000,1018   ;1953           NOP
U 1018, 0000,003D,0180,0800,0000,1156   ;1954   =0      CALL,J/DCE
U 1019, 0000,003E,0180,0800,0000,0001   ;1955           RETURN1
                                        ;1956   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 1143, 0118,0038,1B80,0800,0000,1158   ;1957   S00:    ALU_O(K),D_D.LEFT2,SI/7,J/SX
U 1144, 0118,0038,0B80,0800,0000,1158   ;1958   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1145, 0118,0038,0780,0800,0000,1158   ;1959   S10:    ALU_K[.1],D_D.LEFT2,SI/7.J/SX
U 1146, 0118,0038,C380,0800,0000,1158   ;1960   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 1147, 0018,0038,1980,0800,0000,1143   ;1961   DC0:    ALU_O(K),J/S00
U 1148, 0018,0038,1980,0800,0000,1144   ;1962   DC1:    ALU_O(K),J/S01
U 1149, 0018,0038,1980,0800,0000,1145   ;1963   DC2:    ALU_O(K),J/S10
U 114A, 0018,0038,1980,0800,0000,1146   ;1964   DC3:    ALU_O(K),J/S11
U 114B, 0018,0038,0980,0800,0000,1143   ;1965   DC4:    ALU_K[.2],J/S00
U 114C, 0018,0038,0980,0800,0000,1144   ;1966   DC5:    ALU_K[.2],J/S01
U 114D, 0018,0038,0980,0800,0000,1145   ;1967   DC6:    ALU_K[.2],J/S10
U 114E, 0018,0038,0980,0800,0000,1146   ;1968   DC7:    ALU_K[.2],J/S11
U 114F, 0018,0038,0580,0800,0000,1143   ;1969   DC8:    ALU_K[.1],J/S00
U 1150, 0018,0038,0580,0800,0000,1144   ;1970   DC9:    ALU_K[.1],J/S01
```

```
U 1151, 0018,0038,0580,0800,0000,1145   ;1971   DCA:    ALU_K[.1],J/S10
U 1152, 0018,0038,0580,0800,0000,1146   ;1972   DCB:    ALU_K[.1],J/S11
U 1153, 0018,0038,C180,0800,0000,1143   ;1973   DCC:    ALU_K[.FFFF],J/S00
U 1154, 0018,0038,C180,0800,0000,1144   ;1974   DCD:    ALU_K[.FFFF],J/S01
U 1156, 0018,0038,C180,0800,0000,1145   ;1975   DCE:    ALU_K[.FFFF],J/S10
U 1157, 0018,0038,C180,0800,0000,1146   ;1976   DCF:    ALU_K[.FFFF],J/S11
U 1158, 0100,003E,0380,0800,0000,0001   ;1977   SX:     D_D.LEFT2,SI/7,RETURN1
U 1159, 0018,0038,01C0,0800,0000,101A   ;1978   DC.5:   Q_K[.8]
                                        ;1979   =0
U 101A, 0000,003D,0180,0800,0000,114C   ;1980   DC.5A:  CALL,J/DC5
U 101B, 0019,2000,05C0,0800,0010,115A   ;1981           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 115A, 0000,013C,0180,0800,0000,101C   ;1982           Z?
U 101C, 0000,003C,0180,0800,0000,101A   ;1983   =0      J/DC.5A
U 101D, 0000,003E,0180,0800,0000,0001   ;1984           RETURN1
                                        ;1985   =0
U 101E, 0000,003D,0180,0800,0000,1159   ;1986   DC.A:   CALL,J/DC.5
U 101F, 0500,003E,0180,0800,0000,0001   ;1987           D_D.LEFT,SI/ZERO,RETURN1
U 115B, 0018,0038,01C0,0800,0000,1020   ;1988   DC.9:   Q_K[.8]
                                        ;1989   =0
U 1020, 0000,003D,0180,0800,0000,1150   ;1990   DC.9A:  CALL,J/DC9
U 1021, 0019,2000,05C0,0800,0010,115C   ;1991           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 115C, 0000,013C,0180,0800,0000,1022   ;1992           Z?
U 1022, 0000,003C,0180,0800,0000,1020   ;1993   =0      J/DC.9A
U 1023, 0000,003E,0180,0800,0000,0001   ;1994           RETURN1
                                        ;1995   =0
U 1024, 0000,003D,0180,0800,0000,115B   ;1996   DC.C:   CALL,J/DC.9
U 1025, 0018,0038,C180,0800,0000,115D   ;1997           ALU_K[.FFFF]
U 115D, 0600,003E,0380,0800,0000,0001   ;1998           D_D.RIGHT,SI/7,RETURN1
                                        ;1999   =0
U 1026, 0000,003D,0180,0800,0000,115B   ;2000   DC.6:   CALL,J/DC.9
U 1027, 0018,0038,0580,0800,0000,115E   ;2001           ALU_K[.1]
U 115E, 0100,003E,0380,0800,0000,0001   ;2002           D_D.LEFT2,SI/7,RETURN1
                                        ;2003   =0
U 1028, 0000,003D,0180,0800,0000,115B   ;2004   DC.3:   CALL,J/DC.9
U 1029, 0018,0038,C180,0800,0000,115F   ;2005           ALU_K[.FFFF]
U 115F, 0500,003E,0380,0800,0000,0001   ;2006           D_D.LEFT,SI/7,RETURN1
                                        ;2007   ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
                                        ;2008   ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
                                        ;2009   ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 1160, 0000,003F,0180,0800,0000,117C   ;2010   TARGC3: SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001   ;2011   117C:   RETURN1
U 117D, 0000,003E,0180,0800,0000,0002   ;2012   117D:   RETURN2
U 117E, 0000,003E,0180,0800,0000,0003   ;2013   117E:   RETURN3
U 117F, 0000,003E,0180,0800,0000,0004   ;2014   117F:   RETURN4
U 11FC, 0000,003D,0180,0800,0000,1138   ;2015   11FC:   ERROR1
U 11FD, 0000,003D,0180,0800,0000,1138   ;2016   11FD:   ERROR1
U 11FE, 0000,003D,0180,0800,0000,1138   ;2017   11FE:   ERROR1
U 11FF, 0000,003D,0180,0800,0000,1138   ;2018   11FF:   ERROR1
                                        ;2019   ; THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAAA IN THE D REGISTER.
U 1161, 0F18,0038,5DC0,0800,0000,102A   ;2020   DCLA:   D_0,Q_K[.7]
                                        ;2021   =0
U 102A, 0000,003D,0180,0800,0000,1151   ;2022   DCLA1:  CALL,J/DCA
U 102B, 0001,203C,0180,0800,0010,1162   ;2023           ALU_Q,CLK.UBCC
U 1162, 0000,013C,0180,0800,0000,102C   ;2024           Z?
U 102C, 0019,2000,05C0,0800,0000,102A   ;2025   =0      Q_Q-K[.1],J/DCLA1
```

```
U 102D, 0000,003E,0180,0800,0000,0001    ;2026            RETURN1
                                         ;2027    ; THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
                                         ;2028    ; THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
                                         ;2029    ; IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED, IF NO
                                         ;2030    ; UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
                                         ;2031    ; IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
                                         ;2032    ; TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
                                         ;2033    ; WILL CONTAIN THE READ DATA.
                                         ;2034    =0
U 102E, 0F00,003D,0180,0800,0000,114D    ;2035    RHOH1:  D_0,CALL,J/DC6
U 102F, 0000,003C,0180,0800,0000,1035    ;2036            J7READ
                                         ;2037    =0
U 1030, 0F00,003D,0180,0800,0000,1149    ;2038    RHOM1:  D_0,CALL,J/DC2
U 1031, 0000,003C,0180,0800,0000,1035    ;2039            J7READ
                                         ;2040    =0
U 1032, 0F00,003D,0180,0800,0000,114B    ;2041    RMOH1:  D_0,CALL,J/DC4
U 1033, 0000,003C,0180,0800,0000,1035    ;2042            J7READ
                                         ;2043    =0
U 1034, 0F00,003C,0180,0800,0000,1035    ;2044    RMOM1:  D_0,J/READ
U 1035, 0000,003C,01F8,0800,0084,7163    ;2045    READ:   SC_K[.8],Q_0            ; CALCULATE THE EXPECTED HIT/MISS BITS
U 1163, 0D00,003C,0180,0800,0000,1164    ;2046            D_DAL.SC
U 1164, 0001,003C,0180,09E8,0000,1165    ;2047            RC[0D]_D
U 1165, 0000,003C,0180,0A70,0000,1166    ;2048            LAB_R[0E]
U 1166, 0000,003C,0180,52F8,0000,1167    ;2049            R[0F]_LA,FS/MCT,MCT/READ.V.WCHK
U 1167, 0001,003C,0180,09D0,0000,1168    ;2050            RC[0A]_D
U 1168, 0000,003C,75F0,2C00,0000,1169    ;2051            Q_ID[MAINT]
U 1169, 0800,003C,0180,0A78,0000,116A    ;2052            D_R[0F]
U 116A, 0003,003C,0180,0AF8,0000,116B    ;2053            R[0F]_0
U 116B, 0001,203C,0180,09E0,0000,116C    ;2054            RC[0C]_Q
U 116C, 0000,003C,01C0,0A70,0000,116D    ;2055            Q_R[0E]
U 116D, 0001,003C,0180,09C8,0000,116E    ;2056            RC[9]_D
U 116E, 001D,2000,0180,0800,0010,116F    ;2057            ALU_Q-D,CLK.UBCC
U 116F, 0000,013C,0180,0800,0000,1036    ;2058            Z?
U 1036, 0000,003C,0180,0800,0000,1176    ;2059    =0      J/RERR
U 1037, 0818,0038,D5F8,0800,0000,1170    ;2060            Q_0,D_K[.6]
U 1170, 0000,003C,0180,0800,0084,7171    ;2061            SC_K[.8]
U 1171, 0D10,0038,01C0,0960,0000,1172    ;2062            D_DAL.SC,Q_RC[0C]
U 1172, 001D,2034,01C0,0800,0000,1173    ;2063            ALU_Q[AND]D,Q_ALU
U 1173, 0810,0038,0180,0968,0000,1174    ;2064            D_RC[0D]
U 1174, 001D,2000,0180,0800,0010,1175    ;2065            ALU_Q-D,CLK.UBCC
U 1175, 0000,013C,0180,0800,0000,1038    ;2066            Z?
U 1038, 0000,003E,0180,0800,0000,0002    ;2067    =0      RETURN2
U 1039, 0810,003A,0180,0950,0000,0003    ;2068            D_RC[0A],RETURN3
U 1176, 0000,003C,79F0,2C00,0000,1177    ;2069    RERR:   Q_ID[PARITY]
U 1177, 0001,203E,0180,09E8,0000,0001    ;2070            RC[0D]_Q,RETURN1
                                         ;2071    ; THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
                                         ;2072    ; AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
                                         ;2073    ; ELSE RETURN2.
U 1178, 0000,003C,0180,0A70,0000,1179    ;2074    WRITE:  LAB_R[0E]
U 1179, 0000,003C,0180,32F8,0000,117A    ;2075            R[0F]_LA,FS/MCT,MCT/WRITE.V.WCHK
U 117A, 0800,003C,0180,0A78,0000,117B    ;2076            D_R[0F]
U 117B, 0003,003C,0180,0AF8,0000,1180    ;2077            R[0F]_0
U 1180, 0000,003C,01C0,0A70,0000,1181    ;2078            Q_R[0E]
U 1181, 001D,2000,0180,0800,0010,1182    ;2079            ALU_Q-D,CLK.UBCC
U 1182, 0000,013C,0180,0800,0000,103A    ;2080            Z?
```

```
U 103A, 0000,003C,0180,0800,0000,1176   ;2081   =0      J/RERR                  ; UTRAPPED.
U 103B, 0000,003E,0180,0800,0000,0002   ;2082           RETURN2                 ; OK NO UTRAP.
                                        ;2083   ; THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
                                        ;2084   ; REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
                                        ;2085   ; CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
                                        ;2086   ; NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
                                        ;2087   ; DISSABLE SBI CYCLES:
U 1183, 0F00,003C,0180,0800,0000,1184   ;2088   SOFF:   D_0
U 1184, 0000,003C,8580,0800,0084,7185   ;2089   S1:     SC_K[.C]
U 1185, 0801,001C,0180,0800,0000,1186   ;2090           ALU_D.ORNOT.MASK,D_ALU
U 1186, 0000,003E,7580,3C00,0000,0001   ;2091           ID[MAINT]_D,RETURN1
                                        ;2092   ; SET FORCE REPLACE GROUP ZERO BIT
U 1187, 0F00,003C,0180,0800,0000,1188   ;2093   R0S:    D_0
U 1188, 0000,003C,6180,0800,0084,7189   ;2094   S2:     SC_K[.F]
U 1189, 0000,003C,0580,0800,0084,B18A   ;2095           SC_SC-K[.1]
U 118A, 0801,001C,0180,0800,0000,1184   ;2096   S3:     ALU_D.ORNOT.MASK,D_ALU,J/S1
                                        ;2097   ; SET FORCE REPLACE GROUP 1 BIT
U 118B, 0F00,003C,0180,0800,0000,118C   ;2098   R1S:    D_0
U 118C, 0000,003C,8980,0800,0084,718A   ;2099   S4:     SC_K[.D],J/S3
                                        ;2100   ; SET FORCE MISS GROUP 0 BIT
U 118D, 0F00,003C,0180,0800,0000,118E   ;2101   M0S:    D_0
U 118E, 0000,003C,6580,0800,0084,718A   ;2102   S5:     SC_K[.10],J/S3
                                        ;2103   ; SET FORCE MISS GROUP 1 BIT
U 118F, 0F00,003C,0180,0800,0000,1190   ;2104   M1S:    D_0
U 1190, 0000,003C,6180,0800,0084,718A   ;2105   S6:     SC_K[.F],J/S3
                                        ;2106   ; SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
U 1191, 0F00,003C,0180,0800,0000,1192   ;2107   M10S:   D_0
U 1192, 0000,003C,6180,0800,0084,7193   ;2108           SC_K[.F]
U 1193, 0801,001C,0180,0800,0000,118E   ;2109   S7:     ALU_D.ORNOT.MASK,D_ALU,J/S5
                                        ;2110   ; SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
U 1194, 0F00,003C,0180,0800,0000,1195   ;2111   R0M1S:  D_0
U 1195, 0000,003C,6180,0800,0084,7196   ;2112           SC_K[.F]
U 1196, 0801,001C,0180,0800,0000,1188   ;2113           ALU_D.ORNOT.MASK,D_ALU,J/S2
                                        ;2114   ; SET FORCE REPLACE GROUP 1 FORCE MISS GROUP 0 BITS
U 1197, 0F00,003C,8980,0800,0084,7193   ;2115   R1M0S:  D_0,SC_K[.D],J/S7
                                        ;2116   ; THIS SUBROUTINE IS CALLED TO GENERATE SOME BASIC DATA AND ADDRESS
                                        ;2117   ; PATTERNS WHICH ARE USED BY MANY OF THE CACHE TESTS. IT LEAVES
                                        ;2118   ; THESE PATTERNS IN THE RC SCRATCH PADS.
                                        ;2119   ;       RC[0]           AAAAAAAA
                                        ;2120   ;       RC[1]           19999000
                                        ;2121   ;       RC[2]           55555555
                                        ;2122   ;       RC[3]           06666000
                                        ;2123   ;       RC[4]           99999999
                                        ;2124   ;       RC[5]           1B6DB000
                                        ;2125   ;       RC[6]           66666666
                                        ;2126   ;       RC[7]           04924000
U 1198, 0F18,0038,5DC0,0800,0000,103C   ;2127   CAPAT:  Q_K[.7],D_0
                                        ;2128   =0
U 103C, 0000,003D,0180,0800,0000,1151   ;2129   CAP1:   CALL,J/DCA
U 103D, 0001,203C,0180,0800,0010,1199   ;2130           ALU_Q,CLK.UBCC
U 1199, 0000,013C,0180,0800,0000,103E   ;2131           Z?
U 103E, 0019,2000,05C0,0800,0000,103C   ;2132   =0      Q_Q-K[.1],J/CAP1
U 103F, 0001,003C,0180,0980,0000,119A   ;2133           RC[0]_D
U 119A, 0001,0028,0180,0990,0000,119B   ;2134           ALU_NOT.D,RC[2]_ALU
U 119B, 0F18,0038,5DC0,0800,0000,1040   ;2135           Q_K[.7],D_0
```

```
                                          ;2136   =0
U 1040, 0000,003D,0180,0800,0000,1150     ;2137   CAP2:   CALL,J/DC9
U 1041, 0001,203C,0180,0800,0010,119C     ;2138           ALU_Q,CLK.UBCC
U 119C, 0000,013C,0180,0800,0000,1042     ;2139           Z?
U 1042, 0019,2000,05C0,0800,0000,1040     ;2140   =0      Q_Q-K[.1],J/CAP2
U 1043, 0001,003C,0180,09A0,0000,119D     ;2141           RC[4]_D
U 119D, 0001,0028,0180,09B0,0000,119E     ;2142           ALU_NOT.D,RC[6]_ALU
U 119E, 0000,003C,89F8,0800,0084,719F     ;2143           Q_0,SC_K[.D]
U 119F, 0D00,003C,0180,0800,0000,11A0     ;2144           D_DAL.SC
U 11A0, 0600,003C,0180,0800,0000,11A1     ;2145           D_D.RIGHT,SI/ZERO
U 11A1, 0001,003C,0180,0988,0000,11A2     ;2146           RC[1]_D
U 11A2, 0810,0038,65F8,0930,0084,71A3     ;2147           D_RC[6],SC_K[.10],Q_0
U 11A3, 0D00,003C,0180,0800,0000,11A4     ;2148           D_DAL.SC
U 11A4, 0200,003C,0180,0800,0000,11A5     ;2149           D_D.RIGHT2,SI/ZERO
U 11A5, 0200,003C,0180,0800,0000,11A6     ;2150           D_D.RIGHT2,SI/ZERO
U 11A6, 0F01,003C,0180,0998,0000,1044     ;2151           RC[3]_D,D_0
U 1044, 0000,003D,0180,0800,0000,1150     ;2152   =0      CALL,J/DC9
U 1045, 0100,003C,0180,0800,0000,1046     ;2153           D_D.LEFT2,SI/ZERO
U 1046, 0000,003D,0180,0800,0000,1150     ;2154   =0      CALL,J/DC9
U 1047, 0500,003C,0180,0800,0000,1048     ;2155           D_D.LEFT,SI/ZERO
U 1048, 0000,003D,0180,0800,0000,114B     ;2156   =0      CALL,J/DC4
U 1049, 0001,0028,0180,09A8,0000,11A7     ;2157           ALU_NOT.D,RC[5]_ALU
U 11A7, 0000,003C,85F8,0800,0084,71A8     ;2158           SC_K[.C],Q_0
U 11A8, 0D00,003C,0180,0800,0000,11A9     ;2159           D_DAL.SC
U 11A9, 0001,003C,0180,09B8,0000,11AA     ;2160           RC[7]_D
U 11AA, 0810,0038,0180,0928,0000,11AB     ;2161           D_RC[5]
U 11AB, 0000,003C,61F8,0800,0084,71AC     ;2162           SC_K[.F],Q_0
U 11AC, 0D00,003C,0180,0800,0000,11AD     ;2163           D_DAL.SC
U 11AD, 0200,003C,0180,0800,0000,11AE     ;2164           D_D.RIGHT2,SI/ZERO
U 11AE, 0600,003C,0180,0800,0000,11AF     ;2165           D_D.RIGHT,SI/ZERO
U 11AF, 0001,003E,0180,09A8,0000,0001     ;2166           RC[5]_D,RETURN1
```

```
                                        ;2167           .PAGE   "TEST E5        MOVING INVERSIONS TEST OF GROUP 0'S ADDRESS MEMORY"
                                        ;2168   ;************************************************************************
                                        ;2169   ;++
                                        ;2170   ; TEST  E5      MOVING INVERSIONS TEST OF GROUP 0'S ADDRESS MEMORY
                                        ;2171   ;
                                        ;2172   ; TEST DESCRIPTION
                                        ;2173   ;       THIS IS A MOVING INVERSIONS TEST OF THE CACHE GROUP 0'S
                                        ;2174   ;       ADDRESS MEMORY.
                                        ;2175   ;
                                        ;2176   ; LOGIC DESCRIPTION
                                        ;2177   ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;2178   ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;2179   ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;2180   ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;2181   ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;2182   ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;2183   ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                        ;2184   ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;2185   ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;2186   ;
                                        ;2187   ; ERROR DESCRIPTION
                                        ;2188   ;       VA REFERENCED
                                        ;2189   ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                        ;2190   ;               ONLY THE HIT AND MISS BITS ARE RELEVANT)
                                        ;2191   ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                        ;2192   ;               UTRAP OCCURS
                                        ;2193   ;       GOT CACHE MAINT REGISTER
                                        ;2194   ;       EXPECTED READ DATA
                                        ;2195   ;       GOT READ DATA
                                        ;2196   ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;2197   ;               FLAG            UTRAP TYPE
                                        ;2198   ;               ----            ----------
                                        ;2199   ;               1DE             NO UTRAP OCCURRED
                                        ;2200   ;               DE              CACHE PARITY UTRAP
                                        ;2201   ;               15E             TB PARITY ERROR
                                        ;2202   ;               19E             TB MISS
                                        ;2203   ;               1CE             TB PROTECTION ERROR
                                        ;2204   ;               1D6             TB MODIFY BIT ERROR
                                        ;2205   ;               1DA             X PAGE UTRAP
                                        ;2206   ;               1DC             UNALIGNED DATA UTRAP
                                        ;2207   ;
                                        ;2208   ;--
                                        ;2209   ;************************************************************************
                                        ;2210   =0
U 104A, 0000,003D,0180,0800,0000,1124   ;2211   MIAGO:  NEWTST
U 104B, 0F00,003C,0180,0800,0000,104C   ;2212           D_0
U 104C, 0000,003D,4980,3C00,0000,1183   ;2213   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 104D, 0818,0038,8180,0800,0000,11B0   ;2214           D_K[.3FF]
U 11B0, 0100,003C,0180,0800,0000,11B1   ;2215           D_D.LEFT2,SI/ZERO
U 11B1, 0001,003C,0180,0AB8,0000,1050   ;2216           R[7]_D                  ; SET UP A COUNTER
U 1050, 0F00,003D,0180,0800,0000,1141   ;2217   =0      D_0,CALL,J/DC.1DE       ; SET UP THE UTRAP FLAG
U 1051, 0001,003C,0180,0AF0,0000,11B2   ;2218           R[0E]_D
U 11B2, 0003,003C,0180,0AF8,0000,11B3   ;2219           R[0F]_0
U 11B3, 0018,0038,D580,09F8,0000,1052   ;2220           RC[0F]_K[.6]
                                        ;2221   =0
```

```
U 1052, 0000,003D,0180,0800,0000,1183   ;2222   MIAGOA: CALL,J/SOFF                 ; CLEAR FORCE REPLACE BITS
U 1053, 0F00,003C,0180,0A38,0200,11B4   ;2223           VA_R[7],D_0                 ; INVALIDATE EVERY LOCATION IN GROUP 1
U 11B4, 0000,003C,0180,9000,0000,1054   ;2224           FS7MCT,MCT/INVALIDATE
U 1054, 0000,003D,0180,0800,0000,1194   ;2225   =0      CALL,J/ROM1S                ; AND CLEAR EVERY LOCATION IN GROUP 0 TAG MEMORY
U 1055, 0800,003C,0180,0A38,0000,11B5   ;2226           D_R[7]
U 11B5, 0000,003C,0180,9800,0000,11B6   ;2227           FS/MCT,MCT/VALIDATE
U 11B6, 0000,003C,0180,0A38,0010,11B7   ;2228           ALU_R[7],CLK.UBCC
U 11B7, 0000,013C,0180,0800,0000,1056   ;2229           Z?
U 1056, 0018,0000,1180,0AB8,0000,1052   ;2230   =0      R[7]_LA-K[.4],J/MIAGOA
U 1057, 0018,0038,0180,0A80,0000,11B8   ;2231           R[0]_K[.8]                  ; MSB COUNTER
U 11B8, 0018,0038,0180,0A88,0000,11B9   ;2232           R[1]_K[.8]                  ; LSB INCREMENT
U 11B9, 0018,0038,1980,0A90,0000,11BA   ;2233           R[2]_K[ZERO]                ; MSB INCREMENT
U 11BA, 0018,0038,49C0,0800,0000,11BB   ;2234           Q_K[.FF]
U 11BB, 0000,003C,03A8,0800,0000,11BC   ;2235           Q_Q.LEFT,SI/7
U 11BC, 0001,203C,0180,0AA0,0000,11BD   ;2236           R[4]_Q                      ; =1FF ADDRESS COUNTER
U 11BD, 0000,003C,0188,0800,0000,11BE   ;2237           Q_Q.[EFT2,SI/ZERO
U 11BE, 0000,003C,01A8,0800,0000,11BF   ;2238           Q_Q.LEFT,SI/ZERO
U 11BF, 0001,203C,0180,0A98,0000,11C0   ;2239           R[3]_Q                      ; =FF8 ADDRESS MASK
U 11C0, 0000,003C,8580,0800,0084,71C1   ;2240           SC_K[.C]
U 11C1, 0803,0010,6580,0800,0084,91C2   ;2241           ALU_MASK+1,D_ALU,SC_SC+K[.10]
U 11C2, 0000,003C,0180,0800,0080,D1C3   ;2242           SC_SC+1                     ; SC=29.
U 11C3, 0003,0010,01C0,0800,0000,11C4   ;2243           ALU_MASK+1,Q_ALU
U 11C4, 001D,0024,0180,0AD0,0000,11C5   ;2244           ALU_D[ANDNOT]Q,R[0A]_ALU ; R[0A]=1FFFF000
U 11C5, 0003,003C,0180,0AA8,0000,11C6   ;2245   MIAGOB: R[5]_0                      ; SET FOREWARD SEQ
U 11C6, 0003,003C,0180,0AB0,0000,11C7   ;2246           R[6]_0                      ; SET ADDRESS<28:12>=0
U 11C7, 0003,003C,0180,0AB8,0000,11C8   ;2247           R[7]_0                      ; ADDRESS POINTER
U 11C8, 0000,003C,0180,0A20,0000,11C9   ;2248           LAB_R[4]
U 11C9, 0000,003C,0180,0AC0,0000,11CA   ;2249           R[8]_LA                     ; ADDRESS COUNTER
U 11CA, 0800,003C,0180,0A38,0000,11CB   ;2250   MIAGOC: D_R[7]                      ; CHECK CURRECT LOCATION
U 11CB, 0001,003C,0180,09D8,0000,11CC   ;2251           RC[0B]_D
U 11CC, 0000,003C,01C0,0A30,0000,11CD   ;2252           Q_R[6]
U 11CD, 001D,2030,0180,09F0,0200,1004   ;2253           A[U_Q[OR]D,VA_ALU,RC[0E]_ALU ; ADDRESS TAG IS EITHER 00000XXX OR 1FFFF000
U 1004, 0000,003D,0180,0800,0000,1030   ;2254   =00     CAL[,J/RHOM1                ; CHECK GROUP 0 HIT
U 1005, 0000,003D,0180,0800,0000,1138   ;2255           ERROR1                      ; UNEXPECTED UTRAP OCCURRED
U 1006, 0000,003D,0180,0800,0000,1138   ;2256           ERROR1                      ; HIT/MISS BITS INCORRECT
U 1007, 0010,0038,01C0,0958,0000,11CE   ;2257           Q_RC[0B]                    ; CHECK DATA
U 11CE, 001D,2000,0180,0800,0010,11CF   ;2258           A[U_Q-D,CLK.UBCC
U 11CF, 0000,013C,0180,0800,0000,1058   ;2259           Z?
U 1058, 0000,003D,0180,0800,0000,1138   ;2260   =0      ERROR1                      ; DATA INCORRECT
U 1059, 0810,0038,0180,0970,0000,11D0   ;2261           D_RC[0E]                    ; COMPLEMENT THE TAG IN THIS LOCATION
U 11D0, 0000,003C,01C0,0A50,0000,11D1   ;2262           Q_R[0A]
U 11D1, 001D,2020,0180,09F0,0200,105C   ;2263           A[U_Q[XOR]D,VA_ALU,RC[0E]_ALU
U 105C, 0000,003D,0180,0800,0000,1194   ;2264   =0      CAL[,J/ROM1S                ; SET FORCE MISS GROUP 1 FORCE REPLACE GROUP 0 BITS
U 105D, 0800,003C,0180,0A38,0000,11D2   ;2265           D_R[7]
U 11D2, 0000,003C,0180,9800,0000,1008   ;2266           FS/MCT,MCT/VALIDATE         ; WRITE GROUP 0
U 1008, 0000,003D,0180,0800,0000,1030   ;2267   =00     CALL,J/RHOM1                ; READ GROUP 0 HIT
U 1009, 0000,003D,0180,0800,0000,1138   ;2268           ERROR1                      ; UNEXPECTED UTRAP OCCURRED
U 100A, 0000,003D,0180,0800,0000,1138   ;2269           ERROR1                      ; HIT/MISS BITS INCORRECT
U 100B, 0010,0038,01C0,0958,0000,11D3   ;2270           Q_RC[0B]                    ; CHECK DATA
U 11D3, 001D,2000,0180,0800,0010,11D4   ;2271           A[U_Q-D,CLK.UBCC
U 11D4, 0000,013C,0180,0800,0000,1060   ;2272           Z?
U 1060, 0000,003D,0180,0800,0000,1138   ;2273   =0      ERROR1                      ; DATA INCORRECT
U 1061, 0000,003C,0180,0A40,0010,11D5   ;2274           ALU_R[8],CLK.UBCC           ; CHECKED ALL LOCATIONS?
U 11D5, 0000,013C,0180,0800,0000,1062   ;2275           Z?
U 1062, 0018,0000,0580,0AC0,0000,11D6   ;2276   =0      R[8]_LA-K[.1],J/MIAGOD  ; IF NOT GO COMPUTE NEXT ADDRESS
```

```
U 1063, 0000,003C,0180,0800,0000,11E3   ;2277            J/MIAGOF
U 11D6, 0000,003C,0180,0A28,0010,11D7   ;2278   MIAGOD:  ALU_R[5],CLK.UBCC        ; SEE IF FOREWARD OR BACKWARD DIRECTION
U 11D7, 0000,013C,0180,0800,0000,1064   ;2279            Z?
U 1064, 0000,003C,0180,0800,0000,11DD   ;2280   =0       J/MIAGOE
U 1065, 0000,003C,01C0,0A08,0000,11D8   ;2281            Q_R[1]                   ; IF FOREWARD INCREMENT LSB'S
U 11D8, 0800,003C,0180,0A38,0000,11D9   ;2282            D_R[7]
U 11D9, 081D,2014,0180,0800,0000,11DA   ;2283            ALU_Q+D,D_ALU
U 11DA, 000D,0024,0180,0A18,0010,11DB   ;2284            LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
U 11DB, 0000,013C,01C0,0A10,0000,1066   ;2285            Z?,Q_R[2]
U 1066, 081D,2014,0180,0800,0000,1067   ;2286   =0       ALU_Q+D,D_ALU            ; INCREMENT MSB'S
U 1067, 0000,003C,01C0,0A18,0000,11DC   ;2287            Q_R[3]
U 11DC, 001D,0034,0180,0AB8,0000,11CA   ;2288            ALU_D[AND]Q,R[7]_ALU,J/MIAGOC ; GO TEST NEXT ADDRESS
U 11DD, 0000,003C,01C0,0A08,0000,11DE   ;2289   MIAGOE:  Q_R[1]                   ; IF BACK WARD DECREMENT LSB'S
U 11DE, 0800,003C,0180,0A38,0000,11DF   ;2290            D_R[7]
U 11DF, 081D,0000,0180,0800,0000,11E0   ;2291            ALU_D-Q,D_ALU
U 11E0, 000D,0024,0180,0A18,0010,11E1   ;2292            LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
U 11E1, 0000,013C,01C0,0A10,0000,1068   ;2293            Z?,Q_R[2]
U 1068, 081D,0000,0180,0800,0000,1069   ;2294   =0       ALU_D-Q,D_ALU            ; DECREMENT MSB'S
U 1069, 0000,003C,01C0,0A18,0000,11E2   ;2295            Q_R[3]
U 11E2, 001D,0034,0180,0AB8,0000,11CA   ;2296            ALU_D[AND]Q,R[7]_ALU,J/MIAGOC ; GO TEST NEXT ADDRESS
U 11E3, 0000,003C,0180,0A30,0010,11E4   ;2297   MIAGOF:  ALU_R[6],CLK.UBCC        ; IS TAG PATTERN 00000XXX
U 11E4, 0000,013C,0180,0800,0000,106A   ;2298            Z?
U 106A, 0000,003C,0180,0800,0000,11EA   ;2299   =0       J/MIAGOH                 ; ADDR<28:12>=1'S
U 106B, 0000,003C,0180,0A50,0000,11E5   ;2300            LAB_R[0A]                ; IF YES SET TAG TO 1FFFFXXX
U 11E5, 0000,003C,0180,0AB0,0000,11E6   ;2301            R[6]_LA                  ; AND CONTINUE IN THE SAME DIRECTION
U 11E6, 0800,003C,0180,0A20,0000,11E7   ;2302   MIAGOG:  D_R[4]
U 11E7, 0001,003C,0180,0AC0,0000,11E8   ;2303            R[8]_D
U 11E8, 0000,003C,0180,0A28,0010,11E9   ;2304            ALU_R[5],CLK.UBCC
U 11E9, 0800,013C,0180,0A18,0000,106C   ;2305            Z?,D_R[3]
U 106C, 0001,003C,0180,0AB8,0000,11CA   ;2306   =0       R[7]_D,J/MIAGOC
U 106D, 0003,003C,0180,0AB8,0000,11CA   ;2307            R[7]_0,J/MIAGOC
U 11EA, 0000,003C,0180,0A28,0010,11EB   ;2308   MIAGOH:  ALU_R[5],CLK.UBCC        ; IS DIRECT FOREWARD
U 11EB, 0000,013C,0180,0800,0000,106E   ;2309            Z?
U 106E, 0000,003C,0180,0800,0000,11ED   ;2310   =0       J/MIAGOI
U 106F, 0003,003C,0180,0AB0,0000,11EC   ;2311            R[6]_0                   ; IF WAS FOREWARD SET DIRECTION
U 11EC, 001B,0000,0580,0AA8,0000,11E6   ;2312            ALU_0-K[.1],R[5]_ALU,J/MIAGOG ; TO BACKWARD AND CONTINUE
U 11ED, 0000,003C,0180,0A00,0010,11EE   ;2313   MIAGOI:  ALU_R[0],CLK.UBCC        ; HAVE ALL ADDRESS BITS USED
U 11EE, 0000,013C,0180,0800,0000,1070   ;2314            Z?                       ; AS THE LSB?
U 1070, 0018,0000,0580,0A80,0000,11EF   ;2315   =0       R[0]_LA-K[.1],J/MIAGOJ
U 1071, 0000,003C,0180,0800,0000,11F3   ;2316            J/MIAGOK                 ; IF YES THEN DONE.
U 11EF, 0800,003C,0180,0A08,0000,11F0   ;2317   MIAGOJ:  D_R[1]                   ; ELSE SHIFT THE LSB LEFT IN THE ADDRESS
U 11F0, 0500,003C,0180,0800,0000,11F1   ;2318            D_D.LEFT,SI/ZERO
U 11F1, 0001,003C,0180,0A88,0000,11F2   ;2319            R[1]_D
U 11F2, 0018,0038,0180,0A90,0000,11C5   ;2320            R[2]_K[.8],J/MIAGOB
U 11F3, 0000,003C,0180,0800,0000,1072   ;2321   MIAGOK:  NOP
```

```
                                          ;2322         .PAGE   "TEST E6        MOVING INVERSIONS TEST OF GROUP 1'S ADDRESS MEMORY"
                                          ;2323   ;***********************************************************************
                                          ;2324   ;++
                                          ;2325   ; TEST  E6       MOVING INVERSIONS TEST OF GROUP 1'S ADDRESS MEMORY
                                          ;2326   ;
                                          ;2327   ; TEST DESCRIPTION
                                          ;2328   ;       THIS IS A MOVING INVERSIONS TEST OF THE CACHE GROUP 1'S
                                          ;2329   ;       ADDRESS MEMORY.
                                          ;2330   ;
                                          ;2331   ; LOGIC DESCRIPTION
                                          ;2332   ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                          ;2333   ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                          ;2334   ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                          ;2335   ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                          ;2336   ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                          ;2337   ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                          ;2338   ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                          ;2339   ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                          ;2340   ;       REGISTER ON THE SBI CONTROL MODULE.
                                          ;2341   ;
                                          ;2342   ; ERROR DESCRIPTION
                                          ;2343   ;       VA REFERENCED
                                          ;2344   ;       EXPECTED CONTENTS OF CACHE MAINT REGISTER (NOTE THAT
                                          ;2345   ;               ONLY THE HIT AND MISS BITS ARE RELEVANT)
                                          ;2346   ;               OR GOT CACHE PARITY REGISTER IF UNEXPECTED
                                          ;2347   ;               UTRAP OCCURS
                                          ;2348   ;       GOT CACHE MAINT REGISTER
                                          ;2349   ;       EXPECTED READ DATA
                                          ;2350   ;       GOT READ DATA
                                          ;2351   ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                          ;2352   ;               FLAG            UTRAP TYPE
                                          ;2353   ;               ----            ----------
                                          ;2354   ;               1DE             NO UTRAP OCCURRED
                                          ;2355   ;               DE              CACHE PARITY UTRAP
                                          ;2356   ;               15E             TB PARITY ERROR
                                          ;2357   ;               19E             TB MISS
                                          ;2358   ;               1CE             TB PROTECTION ERROR
                                          ;2359   ;               1D6             TB MODIFY BIT ERROR
                                          ;2360   ;               1DA             X PAGE UTRAP
                                          ;2361   ;               1DC             UNALIGNED DATA UTRAP
                                          ;2362   ;
                                          ;2363   ;--
                                          ;2364   ;***********************************************************************
                                          ;2365   =0
U 1072, 0000,003D,0180,0800,0000,1124     ;2366   MIAG1:  NEWTST
U 1073, 0F00,003C,0180,0800,0000,1074     ;2367           D_0
U 1074, 0000,003D,4980,3C00,0000,1183     ;2368   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLE S OFF
U 1075, 0818,0038,8180,0800,0000,11F4     ;2369           D_K[.3FF]               ; INITIALIZE A COUNTER
U 11F4, 0100,003C,0180,0800,0000,11F5     ;2370           D_D.LEFT2,SI/ZERO
U 11F5, 0001,003C,0180,0AB8,0000,1076     ;2371           R[7]_D
U 1076, 0F00,003D,0180,0800,0000,1141     ;2372   =0      D_0,CALL,J/DC.1DE       ; SET UP UTRAP FLAG
U 1077, 0001,003C,0180,0AF0,0000,11F6     ;2373           R[0E]_D
U 11F6, 0003,003C,0180,0AF8,0000,11F7     ;2374           R[0F]_0
U 11F7, 0018,0038,D580,09F8,0000,1078     ;2375           RC[0F]_K[.6]
                                          ;2376   =0
```

```
U 1078, 0000,003D,0180,0800,0000,1183   ;2377   MIAG1A: CALL,J/SOFF               ; CLEAR FORCE REPLACE BITS
U 1079, 0F00,003C,0180,0A38,0200,11F8   ;2378           VA_R[7],D_0               ; INVALIDATE EVERY LOCATION
U 11F8, 0000,003C,0180,9000,0000,107A   ;2379           FS7MCT,MCT/INVALIDATE     ; IN GROUP 0
U 107A, 0000,003D,0180,0800,0000,1197   ;2380   =0      CALL,J/R1MOS              ; AND CLEAR THE TAG MEMORY OF GROUP 1
U 107B, 0800,003C,0180,0A38,0000,11F9   ;2381           D_R[7]
U 11F9, 0000,003C,0180,9800,0000,11FA   ;2382           FS/MCT,MCT/VALIDATE
U 11FA, 0000,003C,0180,0A38,0010,11FB   ;2383           ALU_R[7],CLK.UBCC
U 11FB, 0000,013C,0180,0800,0000,107C   ;2384           Z?
U 107C, 0018,0000,1180,0AB8,0000,1078   ;2385   =0      R[7]_LA-K[.4],J/MIAG1A
U 107D, 0018,0038,0180,0A80,0000,1200   ;2386           R[0]_K[.8]                ; MSB COUNTER
U 1200, 0018,0038,0180,0A88,0000,1201   ;2387           R[1]_K[.8]                ; LSB INCREMENT
U 1201, 0018,0038,1980,0A90,0000,1202   ;2388           R[2]_K[ZERO]              ; MSB INCREMENT
U 1202, 0018,0038,49C0,0800,0000,1203   ;2389           Q_K[.FF]
U 1203, 0000,003C,03A8,0800,0000,1204   ;2390           Q_Q.LEFT,SI/7
U 1204, 0001,203C,0180,0AA0,0000,1205   ;2391           R[4]_Q                    ; =1FF ADDRESS COUNTER
U 1205, 0000,003C,0188,0800,0000,1206   ;2392           Q_Q.LEFT2,SI/ZERO
U 1206, 0000,003C,01A8,0800,0000,1207   ;2393           Q_Q.LEFT,SI/ZERO
U 1207, 0001,203C,0180,0A98,0000,1208   ;2394           R[3]_Q                    ; =FF8 ADDRESS MASK
U 1208, 0000,003C,8580,0800,0084,7209   ;2395           SC_K[.C]
U 1209, 0803,0010,6580,0800,0084,920A   ;2396           ALU_MASK+1,D_ALU,SC_SC+K[.10]
U 120A, 0000,003C,0180,0800,0080,D20B   ;2397           SC_SC+1                   ; SC=29.
U 120B, 0003,0010,01C0,0800,0000,120C   ;2398           ALU_MASK+1,Q_ALU
U 120C, 001D,0024,0180,0AD0,0000,120D   ;2399           ALU_D[ANDNOT]Q,R[0A]_ALU ; R[0A]=1FFFF000
U 120D, 0003,003C,0180,0AA8,0000,120E   ;2400   MIAG1B: R[5]_0                    ; SET FOREWARD SEQ
U 120E, 0003,003C,0180,0AB0,0000,120F   ;2401           R[6]_0                    ; SET ADDRESS<28:12>=0
U 120F, 0003,003C,0180,0AB8,0000,1210   ;2402           R[7]_0                    ; ADDRESS POINTER
U 1210, 0000,003C,0180,0A20,0000,1211   ;2403           LAB_R[4]
U 1211, 0000,003C,0180,0AC0,0000,1212   ;2404           R[8]_LA                   ; ADDRESS COUNTER
U 1212, 0800,003C,0180,0A38,0000,1213   ;2405   MIAG1C: D_R[7]                    ; READ CURRENT ADDRESS, TAG IS 00000XXX OR 1FFFF000
U 1213, 0001,003C,0180,09D8,0000,1214   ;2406           RC[0B]_D
U 1214, 0000,003C,01C0,0A30,0000,1215   ;2407           Q_R[6]
U 1215, 001D,2030,0180,09F0,0200,100C   ;2408           ALU_Q[OR]D,VA_ALU,RC[0E]_ALU
U 100C, 0000,003D,0180,0800,0000,1032   ;2409   =00     CALL,J/RMOH1              ; READ GROUP1 HIT
U 100D, 0000,003D,0180,0800,0000,1138   ;2410           ERROR1                    ; UNEXPECTED UTRAP OCCURRED
U 100E, 0000,003D,0180,0800,0000,1138   ;2411           ERROR1                    ; HIT/MISS BITS INCORRECT
U 100F, 0010,0038,01C0,0958,0000,1216   ;2412           Q_RC[0B]                  ; CHECK THE DATA READ
U 1216, 001D,2000,0180,0800,0010,1217   ;2413           ALU_Q-D,CLK.UBCC
U 1217, 0000,013C,0180,0800,0000,107E   ;2414           Z?
U 107E, 0000,003D,0180,0800,0000,1138   ;2415   =0      ERROR1                    ; DATA INCORRECT
U 107F, 0810,0038,0180,0970,0000,1218   ;2416           D_RC[0E]                  ; COMPLEMENT THE TAG IN THIS LOCATION
U 1218, 0000,003C,01C0,0A50,0000,1219   ;2417           Q_R[0A]
U 1219, 001D,2020,0180,09F0,0200,1080   ;2418           ALU_Q[XOR]D,VA_ALU,RC[0E]_ALU
U 1080, 0000,003D,0180,0800,0000,1197   ;2419   =0      CALL,J/R1MOS              ; SET THE FORCE REPLACE GROUP 1 AND FORCE MISS GROUP
U 1081, 0800,003C,0180,0A38,0000,121A   ;2420           D_R[7]
U 121A, 0000,003C,0180,9800,0000,1010   ;2421           FS/MCT,MCT/VALIDATE       ; WRITE GROUP 1
U 1010, 0000,003D,0180,0800,0000,1032   ;2422   =00     CALL,J/RMOH1              ; READ THE COMPLEMENTED TAG
U 1011, 0000,003D,0180,0800,0000,1138   ;2423           ERROR1                    ; UNEXPECTED UTRAP OCCURRED
U 1012, 0000,003D,0180,0800,0000,1138   ;2424           ERROR1                    ; HIT/MISS BITS INCORRECT
U 1013, 0010,0038,01C0,0958,0000,121B   ;2425           Q_RC[0B]                  ; CHECK THE DATA
U 121B, 001D,2000,0180,0800,0010,121C   ;2426           ALU_Q-D,CLK.UBCC
U 121C, 0000,013C,0180,0800,0000,1082   ;2427           Z?
U 1082, 0000,003D,0180,0800,0000,1138   ;2428   =0      ERROR1                    ; DATA INCORRECT
U 1083, 0000,003C,0180,0A40,0010,121D   ;2429           ALU_R[8],CLK.UBCC         ; TESTED ALL LOCATION?
U 121D, 0000,013C,0180,0800,0000,1084   ;2430           Z?
U 1084, 0018,0000,0580,0AC0,0000,121E   ;2431   =0      R[8]_LA-K[.1],J/MIAG1D  ; IF NOT GO COMPUTE NEXT LOCATION
```

```
U 1085, 0000,003C,0180,0800,0000,122B   ;2432            J/MIAG1F
U 121E, 0000,003C,0180,0A28,0010,121F   ;2433   MIAG1D:  ALU_R[5],CLK.UBCC          ; FOREWARD SEQ?
U 121F, 0000,013C,0180,0800,0000,1086   ;2434            Z?
U 1086, 0000,003C,0180,0800,0000,1225   ;2435   =0       J/MIAG1E
U 1087, 0000,003C,01C0,0A08,0000,1220   ;2436            Q_R[1]                     ; IF FOREWARD SEQ INCREMENT LSB'S
U 1220, 0800,003C,0180,0A38,0000,1221   ;2437            D_R[7]
U 1221, 081D,2014,0180,0800,0000,1222   ;2438            ALU_Q+D,D_ALU
U 1222, 000D,0024,0180,0A18,0010,1223   ;2439            LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
U 1223, 0000,013C,01C0,0A10,0000,1088   ;2440            Z?,Q_R[2]
U 1088, 081D,2014,0180,0800,0000,1089   ;2441   =0       ALU_Q+D,D_ALU              ; INCREMENT MSB'S
U 1089, 0000,003C,01C0,0A18,0000,1224   ;2442            Q_R[3]
U 1224, 001D,0034,0180,0AB8,0000,1212   ;2443            ALU_D[AND]Q,R[7]_ALU,J/MIAG1C ; TEST NEXT LOCATION
U 1225, 0000,003C,01C0,0A08,0000,1226   ;2444   MIAG1E:  Q_R[1]                     ; IF BACKWARD SEQ DECREMENT LSB'S
U 1226, 0800,003C,0180,0A38,0000,1227   ;2445            D_R[7]
U 1227, 081D,0000,0180,0800,0000,1228   ;2446            ALU_D-Q,D_ALU
U 1228, 000D,0024,0180,0A18,0010,1229   ;2447            LAB_R[3],ALU_D[ANDNOT]LB,CLK.UBCC
U 1229, 0000,013C,01C0,0A10,0000,108A   ;2448            Z?,Q_R[2]
U 108A, 081D,0000,0180,0800,0000,108B   ;2449   =0       ALU_D-Q,D_ALU              ; DECREMENT MSB'S
U 108B, 0000,003C,01C0,0A18,0000,122A   ;2450            Q_R[3]
U 122A, 001D,0034,0180,0AB8,0000,1212   ;2451            ALU_D[AND]Q,R[7]_ALU,J/MIAG1C ; TEST NEXT LOCATION
U 122B, 0000,003C,0180,0A30,0010,122C   ;2452   MIAG1F:  ALU_R[6],CLK.UBCC          ; TAG=00000XXX?
U 122C, 0000,013C,0180,0800,0000,108C   ;2453            Z?
U 108C, 0000,003C,0180,0800,0000,1232   ;2454   =0       J/MIAG1H                   ; ADDR<28:12>=1'S
U 108D, 0000,003C,0180,0A50,0000,122D   ;2455            LAB_R[0A]                  ; IF TAG=00000XXX MAKE TAG=1FFFFXXX
U 122D, 0000,003C,0180,0AB0,0000,122E   ;2456            R[6]_LA                    ; AND CONTINUE IN SAMF DIRECTION
U 122E, 0800,003C,0180,0A20,0000,122F   ;2457   MIAG1G:  D_R[4]
U 122F, 0001,003C,0180,0AC0,0000,1230   ;2458            R[8]_D
U 1230, 0000,003C,0180,0A28,0010,1231   ;2459            ALU_R[5],CLK.UBCC
U 1231, 0800,013C,0180,0A18,0000,108E   ;2460            Z?,D_R[3]
U 108E, 0001,003C,0180,0AB8,0000,1212   ;2461   =0       R[7]_D,J/MIAG1C
U 108F, 0003,003C,0180,0AB8,0000,1212   ;2462            R[7]_0,J/MIAG1C
U 1232, 0000,003C,0180,0A28,0010,1233   ;2463   MIAG1H:  ALU_R[5],CLK.UBCC          ; FOREWARD DIRECTION
U 1233, 0000,013C,0180,0800,0000,1090   ;2464            Z?
U 1090, 0000,003C,0180,0800,0000,1235   ;2465   =0       J/MIAG1I
U 1091, 0003,003C,0180,0AB0,0000,1234   ;2466            R[6]_0                     ; IF FOREWARD DIRECT ENTER BACKWARD DIRECTION
U 1234, 001B,0000,0580,0AA8,0000,122E   ;2467            ALU_0-K[.1],R[5]_ALU,J/MIAG1G
U 1235, 0000,003C,0180,0A00,0010,1236   ;2468   MIAG1I:  ALU_R[0],CLK.UBCC          ; HAVE ALL ADDRESS BITS BEEN USED AS THE LSB
U 1236, 0000,013C,0180,0800,0000,1092   ;2469            Z?
U 1092, 0018,0000,0580,0A80,0000,1237   ;2470   =0       R[0]_LA-K[.1],J/MIAG1J
U 1093, 0000,003C,0180,0800,0000,123B   ;2471            J/MIAG1K                   ; IF YES THEN DONE
U 1237, 0800,003C,0180,0A08,0000,1238   ;2472   MIAG1J:  D_R[1]                     ; OTHERWISE SHIFT ADDRESS LSB
U 1238, 0500,003C,0180,0800,0000,1239   ;2473            D_D.LEFT,SI/ZERO           ; SET FOREWARD SEQ AND TAG=00000XXX
U 1239, 0001,003C,0180,0A88,0000,123A   ;2474            R[1]_D
U 123A, 0018,0038,0180,0A90,0000,120D   ;2475            R[2]_K[.8],J/MIAG1B
U 123B, 0000,003C,0180,0800,0000,1094   ;2476   MIAG1K:  NOP
```

```
                                                .PAGE   "TEST E7        MDAL TEST 1"
                                         ;*********************************************************************
                                         ;++
                                         ; TEST  E7      MDAL TEST 1
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS IS A TEST OF THE MDAL, MEMORY DATA ALIGNER, USING DT=LONG
                                         ;       AND VA<01:00>= 11, 10 AND 01. EACH OF THESE CONDITIONS
                                         ;       IS TRIED AS A FIRST REFERNCE (WHICH WILL RESULT IN A UTRAP)
                                         ;       AND THEN AS A SECOND REFERENCE.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                         ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                         ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                         ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                         ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                         ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                         ;       IF THE APPROPRIATE HIT SIGNAL IS INCCRRECT FROM THAT MODULE;
                                         ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                         ;       REGISTER ON THE SBI CONTROL MODULE.
                                         ;       THE MDAL MUX, MEMORY DATA ALIGNER IS ON DBP.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       DATA AT LOCATION 0
                                         ;       DATA AT LOCATION 4
                                         ;       DATA READ
                                         ;       EXPECTED DATA READ
                                         ;       ADDRESS READ
                                         ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                         ;               FLAG            UTRAP TYPE
                                         ;               ----            ----------
                                         ;               1DE             NO UTRAP OCCURRED
                                         ;               DE              CACHE PARITY UTRAP
                                         ;               15E             TB PARITY ERROR
                                         ;               19E             TB MISS
                                         ;               1CE             TB PROTECTION ERROR
                                         ;               1D6             TB MODIFY BIT ERROR
                                         ;               1DA             X PAGE UTRAP
                                         ;               1DC             UNALIGNED DATA UTRAP
                                         ;       ERROR FLAG (FOR FAILCHAIN)
                                         ;               0=>ERROR ON FIRST REFERENCE
                                         ;               1=>ERROR ON SECOND REFERENCE
                                         ;
                                         ;--
                                         ;*********************************************************************
                                         =0
U 1094, 0000,003D,0180,0800,0000,1124    MDAL1:  NEWTST
U 1095, 0F03,003C,0180,0AF8,0000,1096            D_0,R[0F]_0
U 1096, 0000,003D,4980,3C00,0000,1183    =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 1097, 0018,0038,5D80,09F8,0000,1098            RC[0F]_K[.7]
U 1098, 0F00,003D,0180,0800,0000,1161    =0      D_0,CALL,J/DCLA         ; GENERATE SOME CONSTANTS
U 1099, 0001,003C,0180,0AB0,0000,123C            R[6]_D                  ; FOR THE TEST, R[6]=AAAAAAAA
U 123C, 081B,0000,05F8,0800,0000,123D            ALU_0-K[.1],D_ALU,Q_0
U 123D, 0000,003C,7180,0800,0084,723E            SC_R[.FFF8]
```

```
U 123E, 0D00,003C,0180,0800,0000,123F    ;2532              D_DAL.SC
U 123F, 0001,003C,0180,0AC8,0000,1240    ;2533              R[9]_D                 ; R[9]=00FFFFFF
U 1240, 0000,003C,7D80,0800,0084,7241    ;2534              SC_K[.18]
U 1241, 0D00,003C,0180,0800,0000,1242    ;2535              D_DAL.SC
U 1242, 0001,003C,0180,0AC0,0000,1243    ;2536              R[8]_D                 ; R[8]=FF000000
U 1243, 0018,0038,0D80,0AB8,0000,109A    ;2537              R[7]_K[.3]             ; USED AS THE ADDRESS
U 109A, 0F00,003D,0180,0800,0000,1141    ;2538    =0        D_0,CALL,J/DC.1DE      ; SET UP UTRAP FLAG
U 109B, 0001,003C,0180,0AF0,0000,1244    ;2539              R[0E]_D
U 1244, 0F18,0038,1980,0800,0200,1245    ;2540              VA_K[ZERO],D_0         ; INVALIDATE LOCATION 0
U 1245, 0000,003C,0180,9000,0000,1246    ;2541              FS7MCT,MCT/INVALIDATE  ; IN BOTH GROUPS.
U 1246, 0000,003C,0180,0803,0000,1247    ;2542              VA_VA+4                ; INVALIDATE LOCATION 4
U 1247, 0000,003C,0180,9000,0000,1248    ;2543              FS7MCT,MCT/INVALIDATE  ; IN BOTH GROUPS.
U 1248, 0000,003C,01C0,0A48,0000,1249    ;2544    MDAL1A:   Q_R[9]                 ; INITIALIZE FLOATING PATTERN
U 1249, 0F19,2014,05C0,0800,0000,124A    ;2545              A[U_Q+K[.1],Q_ALU,D_0  ; FOR MEMORY DATA
U 124A, 0600,003C,00B0,0800,0000,124B    ;2546              D_D.RIGHT,Q_Q.RIGHT,SI/ASHR
U 124B, 0001,003C,0180,0AD0,0000,124C    ;2547              R[0A]_D
U 124C, 0001,203C,0180,0AD8,0000,124D    ;2548              R[0B]_Q
U 124D, 0018,0038,8D80,0AE0,0000,109C    ;2549              R[0C]_K[.1F]           ; INITIALIZE COUNT FOR PATTERN
U 109C, 0000,003D,0180,0800,0000,1137    ;2550    =0        ERLOOP
U 109D, 0003,003C,0180,09C0,0000,124E    ;2551              RC[8]_0                ; ERROR FLAG =>FIRST REFERENCE
U 124E, 0800,003C,0180,0A40,0000,124F    ;2552    MDAL1B:   D_R[8]                 ; GENERATE PATTERN OF FLOATING 0 IN 1'S
U 124F, 080D,0024,0180,0A50,0000,1250    ;2553              LAB_R[0A],ALU_D[ANDNOT]LB,D_ALU ; TO BE WRITTEN INTO LOCATION 0
U 1250, 0001,003C,0180,09F0,0000,109E    ;2554              RC[0E]_D
U 109E, 0018,0039,1980,0800,0200,1187    ;2555    =0        VA_K[ZERO],CALL,J/ROS  ; SET FORCE REPLACE GROUP 0 BIT
U 109F, 0810,0038,0180,0970,0000,1251    ;2556              D_RC[0E]
U 1251, 0000,003C,0180,9800,0000,1252    ;2557              FS/MCT,MCT/VALIDATE    ; WRITE PATTERN INTO GROUP 0
U 1252, 0800,003C,0180,0A48,0000,1253    ;2558              D_R[9]                 ; GENERATE PATTERN OF FLOATING 0 IN 1'S
U 1253, 080D,0024,0180,0A58,0000,1254    ;2559              LAB_R[0B],ALU_D[ANDNOT]LB,D_ALU ; TO BE WRITTEN INTO LOCATION 4
U 1254, 0001,003C,0180,09E8,0000,1255    ;2560              RC[0D]_D
U 1255, 0018,0038,1180,0800,0200,1256    ;2561              VA_K[.4]
U 1256, 0000,003C,0180,9800,0000,1257    ;2562              FS7MCT,MCT/VALIDATE    ; WRITE PATTERN INTO GROUP 0
U 1257, 0800,003C,0180,0A38,0000,1258    ;2563              D_R[7]
U 1258, 0001,003C,0180,09D0,0200,1259    ;2564              VA_D,RC[0A]_D          ; SET UP THE VA FOR THE UNALIGNED REFERENCE
U 1259, 0800,003C,0180,0A30,0000,125A    ;2565              D_R[6]                 ; SET DEFAULT OF D TO AAAAAAAA
U 125A, 0000,003C,0180,0A70,0000,125B    ;2566              LAB_R[0E]
U 125B, 0000,003C,0180,0AF8,0000,125C    ;2567              R[0F]_LA               ; SET UP UTRAP FLAG
U 125C, 0000,003C,0180,5000,0000,125D    ;2568              FS/MCT,MCT/READ.V.WCHK         ; TEST INSTRUCTION. SHOULD UTRAP
U 125D, 0001,003C,0180,09E0,0000,125E    ;2569              RC[0C]_D               ; SAVE DATA READ BY FIRST REFERENCE
U 125E, 0800,003C,0180,0A78,0000,125F    ;2570              D_R[0F]                ; SEE IF A UTRAP OCCURRED
U 125F, 0003,003C,0180,0AF8,0000,1260    ;2571              R[0F]_0
U 1260, 0000,003C,01C0,0A70,0000,1261    ;2572              Q_R[0E]
U 1261, 001D,2000,0180,0800,0010,1262    ;2573              A[U_Q-D,CLK.UBCC
U 1262, 0000,013C,0180,0800,0000,10A0    ;2574              Z?
U 10A0, 0000,003C,0180,0800,0000,1263    ;2575    =0        J/MDAL1C
U 10A1, 0001,003D,0180,09C8,0000,1138    ;2576              ERROR1,RC[9]_D         ; NO UTRAP.
U 1263, 0019,0034,0980,0800,0010,1264    ;2577    MDAL1C:   ALU_D[AND]K[.2],CLK.UBCC ; SEE IF THE UTRAP WAS BECAUSE OF UNALIGNED DATA.
U 1264, 0000,013C,0180,0800,0000,10A2    ;2578              Z?
U 10A2, 0001,003D,0180,09C8,0000,1138    ;2579    =0        ERROR1,RC[9]_D         ; UTRAPPED BUT NOT BECAUSE OF UNALIGNED DATA.
U 10A3, 0018,0038,11C0,0800,0000,1265    ;2580              Q_K[.4]                ; COMPUTE EXPECTED RESULT
U 1265, 0800,003C,0180,0A38,0000,1266    ;2581              D_R[7]                 ; RESULT OF THIS FIRST REFERENCE
U 1266, 081D,2000,0180,0800,0000,1267    ;2582              A[U_Q-D,D_ALU          ; THE RESULT SHOULD BE A ROTATION OF
U 1267, 0500,003C,0180,0800,0000,1268    ;2583              D_D.LEFT,SI/ZERO       ; THE DATA AT LOCATION 0.
U 1268, 0100,003C,0180,0800,0000,1269    ;2584              D_D.LEFT2,SI/ZERO
U 1269, 0001,003C,0180,0AA8,0082,126A    ;2585              SC_D,R[5]_D
U 126A, 0F10,0038,01C0,0970,0000,126B    ;2586              Q_RC[0E],D_0
```

```
U 126B, 0D00,003C,0180,0800,0000,126C   ;2587           D_DAL.SC
U 126C, 0001,003C,0180,09D8,0000,126D   ;2588           RC[0B]_D
U 126D, 0010,0038,01C0,0960,0000,126E   ;2589           Q_RC[0C]
U 126E, 001D,2000,0180,0800,0010,126F   ;2590           ALU_Q-D,CLK.UBCC        ; SEE IF THE ACTUAL RESULT WAS CORRECT.
U 126F, 0000,013C,0180,0800,0000,10A4   ;2591           Z?
U 10A4, 0000,003D,0180,0800,0000,1138   ;2592   =0      ERROR1                  ; THE DATA READ ON THE 1ST REFERENCE WAS INCORRECT
U 10A5, 0018,0038,0580,09C0,0000,1270   ;2593           RC[8]_K[.1]             ; ERROR FLAG FOR SECOND REFERENCE
U 1270, 0800,003C,0180,0A38,0000,1271   ;2594           VA_VA+4,D_R[7]          ; INCREMENT THE VA
U 1271, 0019,0014,1180,09D0,0000,1272   ;2595           ALU_D+K[.4],RC[0A]_ALU
U 1272, 0810,0038,0180,0960,0000,1273   ;2596           D_RC[0C]
U 1273, 0000,003C,0180,0A70,0000,1274   ;2597           LAB_R[0E]
U 1274, 0000,003C,0180,0AF8,0000,1275   ;2598           R[0F]_LA                ; SET UP THE UTRAP FLAG
U 1275, 0000,003C,0180,5000,3000,1276   ;2599           FS/MCT,MCT/READ.V.WCHK,MSC/SECOND.REF    ; SHOULD NOT UTRAP
U 1276, 0001,003C,0180,09E0,0000,1277   ;2600           RC[0C]_D                ; SAVE THE RESULT OF THE 2ND REF.
U 1277, 0800,003C,0180,0A78,0000,1278   ;2601           D_R[0F]                 ; SEE IF A UTRAP OCCURRED
U 1278, 0003,003C,0180,0AF8,0000,1279   ;2602           R[0F]_0
U 1279, 0000,003C,01C0,0A70,0000,127A   ;2603           Q_R[0E]
U 127A, 001D,2000,0180,0800,0010,127B   ;2604           ALU_Q-D,CLK.UBCC
U 127B, 0000,013C,0180,0800,0000,10A6   ;2605           Z?
U 10A6, 0001,003D,0180,09C8,0000,1138   ;2606   =0      ERROR1,RC[9]_D          ; UTRAPPED.
U 10A7, 0000,003C,0180,0A28,0082,127C   ;2607           SC_R[5]                 ; COMPUTE THE RESULT
U 127C, 0810,0038,0180,0968,0000,127D   ;2608           D_RC[0D]                ; OF THIS SECOND REFERENCE
U 127D, 0010,0038,01C0,0970,0000,127E   ;2609           Q_RC[0E]
U 127E, 0D10,0038,01C0,0960,0000,127F   ;2610           D_DAL.SC,Q_RC[0C]
U 127F, 0001,003C,0180,09D8,0000,1280   ;2611           RC[0B]_D
U 1280, 001D,2000,0180,0800,0010,1281   ;2612           ALU_Q-D,CLK.UBCC        ; WAS THE RESULT CORRECT.
U 1281, 0000,013C,0180,0800,0000,10A8   ;2613           Z?
U 10A8, 0000,003D,0180,0800,0000,1138   ;2614   =0      ERROR1                  ; SECOND REFERENCE DATA INCORRECT.
U 10A9, 0800,003C,0180,0A50,0000,1282   ;2615           D_R[0A]                 ; SHIFT THE FLOATING 0 IN 1'S PATTERN
U 1282, 0000,003C,01C0,0A58,0000,1283   ;2616           Q_R[0B]
U 1283, 0600,003C,00B0,0800,0000,1284   ;2617           D_D.RIGHT,Q_Q.RIGHT,SI/ASHR
U 1284, 0001,003C,0180,0AD0,0000,1285   ;2618           R[0A]_D
U 1285, 0001,203C,0180,0AD8,0000,1286   ;2619           R[0B]_Q
U 1286, 0000,003C,0180,0A60,0010,1287   ;2620           ALU_R[0C],CLK.UBCC      ; SEE IF ALL PATTERNS HAVE BEEN TRIED
U 1287, 0000,013C,0180,0800,0000,10AA   ;2621           Z?
U 10AA, 0018,0000,0580,0AE0,0000,124E   ;2622   =0      R[0C]_LA-K[.1],J/MDAL1B ; IF NOT CONTINUE
U 10AB, 0800,003C,7180,0A40,0084,7288   ;2623           SC_K[.FFF8],D_R[8]      ; IF ALL PATTERNS HAVE BEEN
U 1288, 001B,0000,05C0,0800,0000,1289   ;2624           ALU_0-K[.1],Q_ALU       ; TRIED WITH THAT ADDRESS
U 1289, 0D00,003C,0180,0800,0000,128A   ;2625           D_DAL.SC                ; GET READY TO DECREMENT THE ADDRESS
U 128A, 0001,003C,0180,0AC0,0000,128B   ;2626           R[8]_D
U 128B, 0800,003C,01F8,0A48,0000,128C   ;2627           D_R[9],Q_0
U 128C, 0D00,003C,0180,0800,0000,128D   ;2628           D_DAL.SC
U 128D, 0001,003C,0180,0AC8,0000,128E   ;2629           R[9]_D
U 128E, 0000,003C,0180,0A38,0000,128F   ;2630           LAB_R[7]
U 128F, 0018,0000,0580,0AB8,0010,1290   ;2631           R[7]_LA-K[.1],CLK.UBCC  ; HAS EACH ADDRESS 3, 2 AND 1 BEEN TESTED?
U 1290, 0000,013C,0180,0800,0000,10AC   ;2632           Z?
U 10AC, 0000,003C,0180,0800,0000,1248   ;2633   =0      J/MDAL1A                ; IF NOT CONTINUE
U 10AD, 0000,003C,0180,0800,0000,10AE   ;2634           NOP
```

```
                                        ;2635           .PAGE   "TEST E8        MDAL TEST 2"
                                        ;2636   ;******************************************************************
                                        ;2637   ;++
                                        ;2638   ; TEST  E8      MDAL TEST 2
                                        ;2639   ;
                                        ;2640   ; TEST DESCRIPTION
                                        ;2641   ;       THIS IS A TEST OF THE MDAL, MEMORY DATA ALIGNER, USING
                                        ;2642   ;       DT=WORD AND VA<01:00>=11. THIS CONDITION IS TRIED AS
                                        ;2643   ;       A FIRST REFERENCE (WHICH SHOULD UTRAP) AND AS A SECOND
                                        ;2644   ;       REFERENCE.
                                        ;2645   ;
                                        ;2646   ; LOGIC DESCRIPTION
                                        ;2647   ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;2648   ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;2649   ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;2650   ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;2651   ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;2652   ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;2653   ;       IF THE APPROPRIATE HIT SIGNAL IS INCCRRECT FROM THAT MODULE;
                                        ;2654   ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;2655   ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;2656   ;       THE MDAL MUX, MEMORY DATA ALIGNER IS ON DBP.
                                        ;2657   ;
                                        ;2658   ; ERROR DESCRIPTION
                                        ;2659   ;       DATA AT LOCATION 0
                                        ;2660   ;       DATA AT LOCATION 4
                                        ;2661   ;       DATA READ
                                        ;2662   ;       EXPECTED DATA READ
                                        ;2663   ;       ADDRESS READ
                                        ;2664   ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;2665   ;               FLAG            UTRAP TYPE
                                        ;2666   ;               ----            ----------
                                        ;2667   ;               1DE             NO UTRAP OCCURRED
                                        ;2668   ;               DE              CACHE PARITY UTRAP
                                        ;2669   ;               15E             TB PARITY ERROR
                                        ;2670   ;               19E             TB MISS
                                        ;2671   ;               1CE             TB PROTECTION ERROR
                                        ;2672   ;               1D6             TB MODIFY BIT ERROR
                                        ;2673   ;               1DA             X PAGE UTRAP
                                        ;2674   ;               1DC             UNALIGNED DATA UTRAP
                                        ;2675   ;       ERROR FLAG: (FOR FAILCHAIN)
                                        ;2676   ;               0=> ERROR ON FIRST REFERENCE
                                        ;2677   ;               1=> ERROR ON SECOND REFERENCE
                                        ;2678   ;
                                        ;2679   ;--
                                        ;2680   ;******************************************************************
                                        ;2681   =0
U 10AE, 0000,003D,0180,0800,0000,1124   ;2682   MDAL2:  NEWTST
U 10AF, 0F03,003C,0180,0AF8,0000,10B0   ;2683           D_0,R[0F]_0
U 10B0, 0000,003D,4980,3C00,0000,1183   ;2684   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 10B1, 0018,0038,5D80,09F8,0000,10B2   ;2685           RC[0F]_K[.7]
U 10B2, 0F00,003D,0180,0800,0000,1161   ;2686   =0      D_0,CALL,J/DCLA ; GENERATE SOME CONSTANTS
U 10B3, 0001,003C,0180,0AB0,0000,1291   ;2687           R[6]_D                  ; R[6]=AAAAAAAA
U 1291, 0018,0038,4980,0AC8,0000,1292   ;2688           R[9]_K[.FF]             ; R[9]=000000FF
U 1292, 081B,0000,05F8,0800,0000,1293   ;2689           ALU_0-K[.1],D_ALU,Q_0
```

```
U 1293, 0000,003C,7D80,0800,0084,7294   ;2690           SC_K[.18]
U 1294, 0D00,003C,0180,0800,0000,1295   ;2691           D_DAL.SC
U 1295, 0001,003C,0180,0AC0,0000,10B4   ;2692           R[8]_D                  ; R[8]=FF000000
U 10B4, 0F00,003D,0180,0800,0000,1141   ;2693   =0      D_0,CALL,J/DC.1DE       ; SET UP THE UTRAP FLAG
U 10B5, 0001,003C,0180,0AF0,0000,1296   ;2694           R[0E]_D
U 1296, 0F18,0038,1980,0800,0200,1297   ;2695           VA_K[ZERO],D_0          ; INVALIDATE LOCATION 0
U 1297, 0000,003C,0180,9000,0000,1298   ;2696           FS7MCT,MCT/INVALIDATE   ; IN BOTH GROUPS
U 1298, 0000,003C,0180,0803,0000,1299   ;2697           VA_VA+4                 ; INVALIDATE LOCATION 4
U 1299, 0000,003C,0180,9000,0000,129A   ;2698           FS7MCT,MCT/INVALIDATE   ; IN BOTH GROUPS
U 129A, 0018,0038,4180,0AD8,0000,129B   ;2699           R[0B]_K[.80]            ; INITIALIZE FLOATING PATTERN
U 129B, 0003,003C,0180,0AD0,0000,129C   ;2700           R[0A]_0
U 129C, 0018,0038,6180,0AE0,0000,10B6   ;2701           R[0C]_K[.F]             ; SET UP A COUNTER FOR THE PATTERN
U 10B6, 0000,003D,0180,0800,0000,1137   ;2702   =0      ERLOOP
U 10B7, 0003,003C,0180,09C0,0000,129D   ;2703           RC[8]_0                 ; ERROR CODE => FIRST REFERENCE
U 129D, 0800,003C,0180,0A40,0000,129E   ;2704   MDAL2A: D_R[8]                  ; GENERATE THE FLOATING
U 129E, 080D,0024,0180,0A50,0000,129F   ;2705           LAB_R[0A],ALU_D[ANDNOT]LB,D_ALU ; PATTERN TO
U 129F, 0001,003C,0180,09F0,0000,10B8   ;2706           RC[0E]_D                ; BE WRITTEN AT LOCATION 0
U 10B8, 0018,0039,1980,0800,0200,1187   ;2707   =0      VA_K[ZERO],CALL,J/R0S   ; SET THE FORCE REPLACE GROUP 0 BIT
U 10B9, 0810,0038,0180,0970,0000,12A0   ;2708           D_RC[0E]
U 12A0, 0000,003C,0180,9800,0000,12A1   ;2709           FS/MCT,MCT/VALIDATE     ; WRITE PATTERN AT 0
U 12A1, 0800,003C,0180,0A48,0000,12A2   ;2710           D_R[9]                  ; GENERATE THE SECOND
U 12A2, 080D,0024,0180,0A58,0000,12A3   ;2711           LAB_R[0B],ALU_D[ANDNOT]LB,D_ALU ; HALF OF THE FLOATING
U 12A3, 0001,003C,0180,09E8,0000,12A4   ;2712           RC[0D]_D                ; PATTERN TO BE WRITTEN
U 12A4, 0018,0038,1180,0800,0200,12A5   ;2713           VA_K[.4]                ; AT LOCATION 4
U 12A5, 0000,003C,0180,9800,0000,12A6   ;2714           FS7MCT,MCT/VALIDATE     ; WRITE PATTERN INTO GROUP 0
U 12A6, 0018,0038,0D80,09D0,0200,12A7   ;2715           VA_K[.3],RC[0A]_K[.3]   ; SET UP VA=3
U 12A7, 0800,003C,0180,0A30,0000,12A8   ;2716           D_R[6]                  ; PUT DEFAULT PATTERN INTO D=AAAAAAAA
U 12A8, 0000,003C,0180,0A70,0000,12A9   ;2717           LAB_R[0E]
U 12A9, 0000,003C,0180,0AF8,0000,12AB   ;2718           R[0F]_LA                ; SET UP UTRAP FLAG
U 12AB, 0000,403C,0180,5000,0000,12AC   ;2719           DT/WORD,FS/MCT,MCT/READ.V.WCHK  ; SHOULD UTRAP
U 12AC, 0001,003C,0180,09E0,0000,12AD   ;2720           RC[0C]_D                ; SAVE THE DATA READ
U 12AD, 0800,003C,0180,0A78,0000,12AE   ;2721           D_R[0F]                 ; SEE IF A UTRAP OCCURRED
U 12AE, 0003,003C,0180,0AF8,0000,12AF   ;2722           R[0F]_0
U 12AF, 0000,003C,01C0,0A70,0000,12B0   ;2723           Q_R[0E]
U 12B0, 001D,2000,0180,0800,0010,12B1   ;2724           A[U_Q-D,CLK.UBCC
U 12B1, 0000,013C,0180,0800,0000,10BA   ;2725           Z?
U 10BA, 0000,003C,0180,0800,0000,12B2   ;2726   =0      J/MDAL2B
U 10BB, 0001,003D,0180,09C8,0000,1138   ;2727           ERROR1,RC[9]_D          ; DIDN'T UTRAP
U 12B2, 0019,0034,0980,0800,0010,12B3   ;2728   MDAL2B: ALU_D[AND]K[.2],CLK.UBCC ; SEE IF THE UTRAP WAS
U 12B3, 0000,013C,0180,0800,0000,10BC   ;2729           Z?                      ; BECAUSE OF UNALIGNED DATA
U 10BC, 0001,003D,0180,09C8,0000,1138   ;2730   =0      ERROR1,RC[9]_D          ; UTRAP NOT ALIGN ERROR.
U 10BD, 0F00,003C,0180,0800,0084,72B4   ;2731           SC_K[.8],D_0            ; COMPUTE EXPECTED
U 12B4, 0010,0038,01C0,0970,0000,12B5   ;2732           Q_RC[0E]                ; RESULT OF THE 1ST READ
U 12B5, 0D10,0038,01C0,0960,0000,12B6   ;2733           D_DAL.SC,Q_RC[0C]
U 12B6, 0001,003C,0180,09D8,0000,12B7   ;2734           RC[0B]_D
U 12B7, 001D,2000,0180,0800,0010,12B8   ;2735           ALU_Q-D,CLK.UBCC        ; WAS RESULT CORRECT?
U 12B8, 0000,013C,0180,0800,0000,10BE   ;2736           Z?
U 10BE, 0000,003D,0180,0800,0000,1138   ;2737   =0      ERROR1                  ; DATA ERROR ON FIRST READ
U 10BF, 0018,0038,5D80,09D0,0200,12B9   ;2738           VA_K[.7],RC[0A]_K[.7]   ; SET UP VA FOR SEOND REF. =7
U 12B9, 0810,0038,0180,0960,0000,12BA   ;2739           D_RC[0C]
U 12BA, 0000,003C,0180,0A70,0000,12BB   ;2740           LAB_R[0E]
U 12BB, 0000,003C,0180,0AF8,0000,12BC   ;2741           R[0F]_LA                ; SET UP UTRAP FLAG
U 12BC, 0000,403C,0180,5000,3000,12BD   ;2742           DT/WORD,FS/MCT,MCT/READ.V.WCHK,MSC/SECOND.REF ; SHOULD NOT UTRAP
U 12BD, 0001,003C,0180,09E0,0000,12BE   ;2743           RC[0C]_D                ; SAVE THE RESULT
U 12BE, 0800,003C,0180,0A78,0000,12BF   ;2744           D_R[0F]                 ; SEE IF A UTRAP OCCURRED
```

```
U 12BF, 0003,003C,0180,0AF8,0000,12C0   ;2745           R[0F]_0
U 12C0, 0000,003C,01C0,0A70,0000,12C1   ;2746           Q_R[0E]
U 12C1, 001D,2000,0180,0800,0010,12C2   ;2747           ALU_Q-D,CLK.UBCC
U 12C2, 0018,0138,0580,09C0,0000,10C0   ;2748           Z?,RC[8]_K[.1]           ; ERROR CODE => SECOND REFERENCE
U 10C0, 0001,003D,0180,09C8,0000,1138   ;2749    =0     ERROR1,RC[9]_D           ; UTRAPPED
U 10C1, 0000,003C,0180,0800,0084,72C3   ;2750           SC_K[.8]                 ; COMPUTE EXPECTED RESULT OF THIS
U 12C3, 0810,0038,0180,0968,0000,12C4   ;2751           D_RC[0D]                 ; SECOND REFERENCE
U 12C4, 0010,0038,01C0,0970,0000,12C5   ;2752           Q_RC[0E]
U 12C5, 0D10,0038,01C0,0960,0000,12C6   ;2753           D_DAL.SC,Q_RC[0C]
U 12C6, 0001,003C,0180,09D8,0000,12C7   ;2754           RC[0B]_D
U 12C7, 001D,2000,0180,0800,0010,12C8   ;2755           ALU_Q-D,CLK.UBCC         ; WAS DATA READ CORRECT?
U 12C8, 0000,013C,0180,0800,0000,10C2   ;2756           Z?
U 10C2, 0000,003D,0180,0800,0000,1138   ;2757    =0     ERROR1                   ; RESULT INCORRECT
U 10C3, 0800,003C,0180,0A50,0000,12C9   ;2758           D_R[0A]                  ; COMPUTE NEXT TEST PATTERN
U 12C9, 0000,003C,01C0,0A58,0000,12CA   ;2759           Q_R[0B]
U 12CA, 0600,003C,00B0,0800,0000,12CB   ;2760           D_D.RIGHT,Q_Q.RIGHT,SI/ASHR
U 12CB, 0001,203C,0180,0AD0,0000,12CC   ;2761           R[0A]_Q
U 12CC, 0001,003C,0180,0AD8,0000,12CD   ;2762           R[0B]_D
U 12CD, 0000,003C,0180,0A60,0010,12CE   ;2763           ALU_R[0C],CLK.UBCC       ; SEE IF ALL PATTERNS HAVE BEEN TRIED.
U 12CE, 0000,013C,0180,0800,0000,10C4   ;2764           Z?
U 10C4, 0018,0000,0580,0AE0,0000,129D   ;2765    =0     R[0C]_LA-K[.1],J/MDAL2A ; IF NOT CONTINUE
U 10C5, 0000,003C,0180,0800,0000,10C6   ;2766           NOP
```

```
                                               .PAGE   "TEST E9        MDAL TEST 3"
                                        ;*****************************************************************
                                        ;++
                                        ; TEST  E9      MDAL TEST 3
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF THE MDAL, MEMORY DATA ALIGNER, USING DT=WORD
                                        ;       AND VA<01:00>= 10, 01 AND 00.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                        ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;       THE MDAL MUX, MEMORY DATA ALIGNER IS ON DBP.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA AT LOCATION 0
                                        ;       DATA AT LOCATION 4
                                        ;       DATA READ
                                        ;       EXPECTED DATA READ
                                        ;       ADDRESS READ
                                        ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;               FLAG            UTRAP TYPE
                                        ;               ----            ----------
                                        ;               1DE             NO UTRAP OCCURRED
                                        ;               DE              CACHE PARITY UTRAP
                                        ;               15E             TB PARITY ERROR
                                        ;               19E             TB MISS
                                        ;               1CE             TB PROTECTION ERROR
                                        ;               1D6             TB MODIFY BIT ERROR
                                        ;               1DA             X PAGE UTRAP
                                        ;               1DC             UNALIGNED DATA UTRAP
                                        ;
                                        ;--
                                        ;*****************************************************************
                                        =0
U 10C6, 0000,003D,0180,0800,0000,1124   MDAL3:  NEWTST
U 10C7, 0F03,003C,0180,0AF8,0000,10C8           D_0,R[OF]_0
U 10C8, 0000,003D,4980,3C00,0000,1183   =0      ID[TBERO]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 10C9, 0018,0038,D580,09F8,0000,10CA           RC[OF]_K[.6]
U 10CA, 0F00,003D,0180,0800,0000,1161   =0      D_0,CALL,J/DCLA         ; GENERATE SOME CONSTANTS
U 10CB, 0001,003C,0180,0AB0,0000,12CF           R[6]_D                  ; R[6]=AAAAAAAA
U 12CF, 001B,001C,C180,0AC0,0000,12D0           ALU_NOT.K[.FFFF],R[8]_ALU ; R[8]=FFFF0000
U 12D0, 0003,003C,0180,0AC8,0000,12D1           R[9]_0                  ; R[9]=00000000
U 12D1, 0018,0038,0980,0AB8,0000,10CC           R[7]_K[.2]              ; ADDRESS USED
U 10CC, 0F00,003D,0180,0800,0000,1141   =0      D_0,CALL,J/DC.1DE       ; CONSTANT USED AS UTRAP FLAG
U 10CD, 0001,003C,0180,0AF0,0000,12D2           R[OE]_D
U 12D2, 0F18,0038,1980,0800,0200,12D3           VA_K[ZERO],D_0          ; INVALIDATE LOCATION 0
U 12D3, 0000,003C,0180,9000,0000,12D4           FS7MCT,MCT/INVALIDATE   ; IN BOTH GROUPS
```

```
U 12D4, 0000,003C,0180,0803,0000,12D5    ;2822             VA_VA+4                       ; INVALIDATE LOCATION 4
U 12D5, 0000,003C,0180,9000,0000,12D6    ;2823             FS7MCT,MCT/INVALIDATE         ; IN BOTH GROUPS
U 12D6, 0800,003C,0180,0A38,0000,12D7    ;2824    MDAL3A:  D_R[7]                        ; INITIALIZE THE FLOATING
U 12D7, 0100,003C,0180,0800,0000,12D8    ;2825             D_D.LEFT2,SI/ZERO             ; 0 IN 1'S PATTERN
U 12D8, 0518,0038,61C0,0AD8,0000,12D9    ;2826             D_D.LEFT,SI/ZERO,Q_K[.F],R[0B]_K[.F]
U 12D9, 001D,0014,0180,0AD0,0000,10CE    ;2827             A[U_D+Q,R[0A]_ALU
U 10CE, 0000,003D,0180,0800,0000,1137    ;2828    =0       ERLOOP
U 10CF, 0000,003C,0180,0A50,0082,12DA    ;2829    MDAL3B:  SC_R[0A]                      ; GENERATE THE FLOATING PATTERN
U 12DA, 0800,003C,0180,0A40,0000,12DB    ;2830             D_R[8]                        ; TO BE WRITTEN INTO LOCATION 0
U 12DB, 0001,0034,0180,09F0,0000,10D0    ;2831             A[U_D.AND.MASK,RC[0E]_ALU
U 10D0, 0018,0039,1980,0800,0200,1187    ;2832    =0       VA_K[ZERO],CALL,J/ROS         ; SET FORCE REPLACE GROUP 0 BIT
U 10D1, 0810,0038,0180,0970,0000,12DC    ;2833             D_RC[0E]
U 12DC, 0000,003C,0180,9800,0000,12DD    ;2834             FS/MCT,MCT/VALIDATE           ; WRITE LOCATION 0 OF GROUP 0
U 12DD, 0F03,003C,0180,09EB,0000,12DE    ;2835             RC[0D]_0,D_0,VA_VA+4          ; WRITE DATA=00000000 INTO
U 12DE, 0000,003C,0180,9800,0000,12DF    ;2836             FS/MCT,MCT7VALIDATE           ; LOCATION 4 OF GROUP 0
U 12DF, 0800,003C,0180,0A38,0000,12E0    ;2837             D_R[7]
U 12E0, 0001,003C,0180,09D0,0200,12E1    ;2838             VA_D,RC[0A]_D                 ; LOAD ADDRESS INTO VA FOR TEST REF.
U 12E1, 0800,003C,0180,0A30,0000,12E2    ;2839             D_R[6]                        ; SET UP DEFAULT PATTERN IN D
U 12E2, 0000,003C,0180,0A70,0000,12E3    ;2840             LAB_R[0E]
U 12E3, 0000,003C,0180,0AF8,0000,12E4    ;2841             R[0F]_LA                      ; SET UP UTRAP FLAG
U 12E4, 0000,403C,0180,5000,0000,12E5    ;2842             DT/WORD,FS/MCT,MCT/READ.V.WCHK ; TEST INSTRUCTION, SHOULD NOT UTRAP
U 12E5, 0001,003C,0180,09E0,0000,12E6    ;2843             RC[0C]_D                      ; SAVE DATA READ
U 12E6, 0800,003C,0180,0A78,0000,12E7    ;2844             D_R[0F]                       ; SEE IF A UTRAP OCCURRED
U 12E7, 0003,003C,0180,0AF8,0000,12E8    ;2845             R[0F]_0
U 12E8, 0000,003C,01C0,0A70,0000,12E9    ;2846             Q_R[0E]
U 12E9, 001D,2000,0180,0800,0010,12EA    ;2847             A[U_Q-D,CLK.UBCC
U 12EA, 0000,013C,0180,0800,0000,10D2    ;2848             Z?
U 10D2, 0001,003D,0180,09C8,0000,1138    ;2849    =0       ERROR1,RC[9]_D                ; UTRAP OCCURRED.
U 10D3, 0000,003C,0180,0A58,0082,12EB    ;2850             SC_R[0B]                      ; CONPUTE EXPECTED RESULT
U 12EB, 0818,0038,C180,0800,0000,12EC    ;2851             D_K[.FFFF]
U 12EC, 0801,0034,0180,09D8,0000,12ED    ;2852             A[U_D.AND.MASK,RC[0B]_ALU,D_ALU
U 12ED, 0010,0038,01C0,0960,0000,12EE    ;2853             Q_RC[0C]
U 12EE, 001D,2000,0180,0800,0010,12EF    ;2854             A[U_Q-D,CLK.UBCC
U 12EF, 0000,013C,0180,0800,0000,10D4    ;2855             Z?
U 10D4, 0000,003D,0180,0800,0000,1138    ;2856    =0       ERROR1                        ; DATA READ IS INCORRECT
U 10D5, 0800,003C,0180,0A50,0000,12F0    ;2857             D_R[0A]                       ; COMPUTE NEXT TEST PATTERN
U 12F0, 0019,0000,0580,0AD0,0000,12F1    ;2858             A[U_D-K[.1],R[0A]_ALU
U 12F1, 0000,003C,0180,0A58,0010,12F2    ;2859             ALU_R[0B],CLK.UBCC            ; TRIED ALL PATTERNS?
U 12F2, 0000,013C,0180,0800,0000,10D6    ;2860             Z?
U 10D6, 0018,0000,0580,0AD8,0000,10CF    ;2861    =0       R[0B]_LA-K[.1],J/MDAL3B       ; IF NOT CONTINUE.
U 10D7, 0000,003C,71F8,0800,0084,72F3    ;2862             SC_K[.FFF8],Q_0               ; IF ALL PATTERNS HAVE BEEN TRIED
U 12F3, 0800,003C,0180,0A40,0000,12F4    ;2863             D_R[8]                        ; AT THIS ADDRESS GO TO NEXT ADDRESS
U 12F4, 0D00,003C,0180,0800,0000,12F5    ;2864             D_DAL.SC
U 12F5, 0001,003C,0180,0AC0,0000,12F6    ;2865             R[8]_D
U 12F6, 0000,003C,0180,0A38,0010,12F7    ;2866             ALU_R[7],CLK.UBCC             ; HAS EACH OF THE ADDRESSES
U 12F7, 0000,013C,0180,0800,0000,10D8    ;2867             Z?                            ; 2, 1 AND 0 BEEN TESTED
U 10D8, 0018,0000,0580,0AB8,0000,12D6    ;2868    =0       R[7]_LA-K[.1],J/MDAL3A        ; IF NOT CONTINUE
U 10D9, 0000,003C,0180,0800,0000,10DA    ;2869             NOP
```

```
                                                      .PAGE   "TEST EA       MDAL TEST 4"
                                               ;*******************************************************************
                                               ;++
                                               ; TEST  EA      MDAL TEST 4
                                               ;
                                               ; TEST DESCRIPTION
                                               ;       THIS IS A TEST OF  THE MDAL, MEMORY DATA ALIGNER, USING
                                               ;       DT=BYTE AND VA<01:00>= 11, 10, 01 AND 00.
                                               ;
                                               ; LOGIC DESCRIPTION
                                               ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                               ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                               ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                               ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                               ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                               ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                               ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                               ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                               ;       REGISTER ON THE SBI CONTROL MODULE.
                                               ;       THE MDAL MUX, MEMORY DATA ALIGNER IS ON DBP.
                                               ;
                                               ; ERROR DESCRIPTION
                                               ;       DATA AT LOCATION 0
                                               ;       DATA AT LOCATION 4
                                               ;       DATA READ
                                               ;       EXPECTED DATA READ
                                               ;       ADDRESS READ
                                               ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                               ;               FLAG            UTRAP TYPE
                                               ;               ----            ----------
                                               ;               1DE             NO UTRAP OCCURRED
                                               ;               DE              CACHE PARITY UTRAP
                                               ;               15E             TB PARITY ERROR
                                               ;               19E             TB MISS
                                               ;               1CE             TB PROTECTION ERROR
                                               ;               1D6             TB MODIFY BIT ERROR
                                               ;               1DA             X PAGE UTRAP
                                               ;               1DC             UNALIGNED DATA UTRAP
                                               ;
                                               ;--
                                               ;*******************************************************************
                                               =0
U 10DA, 0000,003D,0180,0800,0000,1124          MDAL4:  NEWTST
U 10DB, 0F03,003C,0180,0AF8,0000,10DC                  D_0,R[OF]_0
U 10DC, 0000,003D,4980,3C00,0000,1183          =0      ID[TBERO]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 10DD, 0018,0038,D580,09F8,0000,10DE                  RC[OF]_K[.6]
U 10DE, 0F00,003D,0180,0800,0000,1161          =0      D_0,CALL,J/DCLA         ; GENERATE SOME CONSTANTS
U 10DF, 0001,003C,0180,0AB0,0000,12F8                  R[6]_D                  ; R[6]=AAAAAAAA
U 12F8, 0000,003C,7D80,0800,0084,72F9                  SC_K[.18]
U 12F9, 0003,0010,0180,0AC0,0000,12FA                  ALU_MASK+1,R[8]_ALU     ; R[8]=FF000000
U 12FA, 0018,0038,0D80,0AB8,0000,10E0                  R[7]_K[.3]              ; ADDRESS USED IN TEST
U 10E0, 0F00,003D,0180,0800,0000,1141          =0      D_0,CALL,J/DC.1DE       ; GET CONSTANT USED AS THE UTRAP FLAG
U 10E1, 0001,003C,0180,0AF0,0000,12FB                  R[0E]_D
U 12FB, 0F18,0038,1980,0800,0200,12FC                  VA_K[ZERO],D_0          ; INVALIDATE LOCATION 0
U 12FC, 0000,003C,0180,9000,0000,12FD                  FS?MCT,MCT/INVALIDATE   ; IN BOTH GROUPS
```

```
U 12FD, 0000,003C,0180,0803,0000,12FE    ;2925              VA_VA+4                  ; INVALIDATE LOACTION 4
U 12FE, 0000,003C,0180,9000,0000,12FF    ;2926              FS7MCT,MCT/INVALIDATE    ; IN BOTH GROUPS
U 12FF, 0800,003C,0180,0A38,0000,1300    ;2927     MDAL4A:  D_R[7]                   ; INITIALIZE THE FLOATING
U 1300, 0100,003C,0180,0800,0000,1301    ;2928              D_D.LEFT2,SI/ZERO        ; 0 IN 1'S PATTERN
U 1301, 0518,0038,5DC0,0AD8,0000,1302    ;2929              D_D.LEFT,SI/ZERO,Q_K[.7],R[0B]_K[.7]
U 1302, 001D,0014,0180,0AD0,0000,10E2    ;2930              A[U_D+Q,R[0A]_ALU
U 10E2, 0000,003D,0180,0800,0000,1137    ;2931     =0       ERLOOP
U 10E3, 0000,003C,0180,0A50,0082,1303    ;2932     MDAL4B:  SC_R[0A]                 ; GENERATE THE DATA PATTERN
U 1303, 0800,003C,0180,0A40,0000,1304    ;2933              D_R[8]                   ; WRITTEN INTO LOCATION 0
U 1304, 0001,0034,0180,09F0,0000,10E4    ;2934              A[U_D.AND.MASK,RC[0E]_ALU
U 10E4, 0018,0039,1980,0800,0200,1187    ;2935     =0       VA_R[ZERO],CALL,J/ROS    ; SET THE FORCE REPLACE GROUP 0 BIT
U 10E5, 0810,0038,0180,0970,0000,1305    ;2936              D_RC[0E]
U 1305, 0000,003C,0180,9800,0000,1306    ;2937              FS/MCT,MCT/VALIDATE      ; WRITE LOCATION 0 OF GROUP 0
U 1306, 0F03,003C,0180,09EB,0000,1307    ;2938              RC[0D]_0,D_0,VA_VA+4     ; WRITE DATA=00000000 INTO
U 1307, 0000,003C,0180,9800,0000,1308    ;2939              FS/MCT,MCT7VALIDATE      ; LOCATION 4 OF GROUP 0
U 1308, 0800,003C,0180,0A38,0000,1309    ;2940              D_R[7]                   ; GET TEST ADDRESS
U 1309, 0001,003C,0180,09D0,0200,130A    ;2941              VA_D,RC[0A]_D
U 130A, 0800,003C,0180,0A30,0000,130B    ;2942              D_R[6]                   ; SET DEFAULT VALUE OF D
U 130B, 0000,003C,0180,0A70,0000,130C    ;2943              LAB_R[0E]
U 130C, 0000,003C,0180,0AF8,0000,130D    ;2944              R[0F]_LA                 ; SET UP UTRAP FLAG
U 130D, 0000,803C,0180,5000,0000,130E    ;2945              DT/BYTE,FS/MCT,MCT/READ.V.WCHK ; TEST INSTRUCTION, SHOULD NOT UTRAP
U 130E, 0001,003C,0180,09E0,0000,130F    ;2946              RC[0C]_D                 ; SAVE READ DATA
U 130F, 0800,003C,0180,0A78,0000,1310    ;2947              D_R[0F]                  ; SEE IF A UTRAP OCCURRED
U 1310, 0003,003C,0180,0AF8,0000,1311    ;2948              R[0F]_0
U 1311, 0000,003C,01C0,0A70,0000,1312    ;2949              Q_R[0E]
U 1312, 001D,2000,0180,0800,0010,1313    ;2950              A[U_Q-D,CLK.UBCC
U 1313, 0000,013C,0180,0800,0000,10E6    ;2951              Z?
U 10E6, 0001,003D,0180,09C8,0000,1138    ;2952     =0       ERROR1,RC[9]_D           ; UTRAPPED
U 10E7, 0000,003C,0180,0A58,0082,1314    ;2953              SC_R[0B]                 ; COMPUTE EXPECTED RESULT.
U 1314, 0818,0038,4980,0800,0000,1315    ;2954              D_K[.FF]
U 1315, 0801,0034,0180,09D8,0000,1316    ;2955              A[U_D.AND.MASK,RC[0B]_ALU,D_ALU
U 1316, 0010,0038,01C0,0960,0000,1317    ;2956              Q_RC[0C]
U 1317, 001D,2000,0180,0800,0010,1318    ;2957              A[U_Q-D,CLK.UBCC         ; CHECK RESULT
U 1318, 0000,013C,0180,0800,0000,10E8    ;2958              Z?
U 10E8, 0000,003D,0180,0800,0000,1138    ;2959     =0       ERROR1                   ; DATA READ INCORRECT
U 10E9, 0800,003C,0180,0A50,0000,1319    ;2960              D_R[0A]                  ; COMPUTE NEXT DATA PATTERN
U 1319, 0019,0000,0580,0AD0,0000,131A    ;2961              A[U_D-K[.1],R[0A]_ALU
U 131A, 0000,003C,0180,0A58,0010,131B    ;2962              ALU_R[0B],CLK.UBCC       ; TRIED ALL PATTERNS?
U 131B, 0000,013C,0180,0800,0000,10EA    ;2963              Z?
U 10EA, 0018,0000,0580,0AD8,0000,10E3    ;2964     =0       R[0B]_LA-K[.1],J/MDAL4B  ; IF NOT CONTINUE
U 10EB, 0000,003C,71F8,0800,0084,731C    ;2965              SC_K[.FFF8],Q_0          ; SET UP TO TEST NEXT ADDRESS
U 131C, 0800,003C,0180,0A40,0000,131D    ;2966              D_R[8]
U 131D, 0D00,003C,0180,0800,0000,131E    ;2967              D_DAL.SC
U 131E, 0001,003C,0180,0AC0,0000,131F    ;2968              R[8]_D
U 131F, 0000,003C,0180,0A38,0010,1320    ;2969              ALU_R[7],CLK.UBCC        ; TESTED ALL ADDRESSES?
U 1320, 0000,013C,0180,0800,0000,10EC    ;2970              Z?
U 10EC, 0018,0000,0580,0AB8,0000,12FF    ;2971     =0       R[7]_LA-K[.1],J/MDAL4A   ; IF NOT CONTINUE.
U 10ED, 0000,003C,0180,0800,0000,10EE    ;2972              NOP
```

```
                                          .PAGE   "TEST EB        BAL TEST 1"
                                    ;******************************************************************
                                    ;++
                                    ; TEST  EB      BAL TEST 1
                                    ;
                                    ; TEST DESCRIPTION
                                    ;       THIS IS A TEST OF THE BAL, BYTE ALIGNER, AND THE BYTE MASK
                                    ;       GENERATER USING DT=LONG AND VA<01:00>= 11, 10 AND 01. EACH
                                    ;       CONDITION IS TRIED AS A FIRST REFERENCE (WHICH SHOULD
                                    ;       RESULT IN AN UNALIGNED DATA UTRAP) AND THEN AS A
                                    ;       SECOND REFERENCE.
                                    ;
                                    ; LOGIC DESCRIPTION
                                    ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                    ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                    ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                    ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                    ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                    ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                    ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                    ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                    ;       REGISTER ON THE SBI CONTROL MODULE.
                                    ;       THE BYTE ALIGNER IS ON DBP.
                                    ;
                                    ; ERROR DESCRIPTION
                                    ;       EXPECTED DATA AT LOCATION 0
                                    ;       EXPECTED DATA AT LOCATION 4
                                    ;       GOT DATA AT LOCATION 0
                                    ;       GOT DATA AT LOCATION 4
                                    ;       ADDRESS WRITTEN
                                    ;       DATA WRITTEN
                                    ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                    ;               FLAG            UTRAP TYPE
                                    ;               ----            ----------
                                    ;               1DE             NO UTRAP OCCURRED
                                    ;               DE              CACHE PARITY UTRAP
                                    ;               15E             TB PARITY ERROR
                                    ;               19E             TB MISS
                                    ;               1CE             TB PROTECTION ERROR
                                    ;               1D6             TB MODIFY BIT ERROR
                                    ;               1DA             X PAGE UTRAP
                                    ;               1DC             UNALIGNED DATA UTRAP
                                    ;
                                    ;--
                                    ;******************************************************************
                                    =0
U 10EE, 0000,003D,0180,0800,0000,1124   BAL1:   NEWTST
U 10EF, 0F03,003C,0180,0AF8,0000,10F0           D_0,R[OF]_0
U 10F0, 0000,003D,4980,3C00,0000,1183   =0      ID[TBERO]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 10F1, 0018,0038,5D80,09F8,0000,1321           RC[OF]_K[.7]
U 1321, 0018,0038,0980,0AB8,0000,10F2           R[7]_K[.2]              ; SET UP A COUNTER FOR THE ADDRESS USED
U 10F2, 0F00,003D,0180,0800,0000,1141   =0      D_0,CALL,J/DC.1DE       ; GET CONSTANT USED AS UTRAP FLAG
U 10F3, 0001,003C,0180,0AF0,0000,1322           R[OE]_D
U 1322, 0F18,0038,1980,0800,0200,1323           VA_K[ZERO],D_0          ; INVALIDATE LOCATION 0
U 1323, 0000,003C,0180,9000,0000,1324           FS7MCT,MCT/INVALIDATE   ; IN BOTH GROUPS
```

```
U 1324, 0000,003C,0180,0803,0000,1325   ;3028             VA_VA+4                  ; INVALIDATE LOCATION 4 IN BOTH GROUPS
U 1325, 0000,003C,0180,9000,0000,1326   ;3029             FS7MCT,MCT/INVALIDATE
U 1326, 0800,003C,0180,0A38,0000,1327   ;3030   BAL1A:    D_R[7]                   ; COMPUTE CURRENT ADDRESS
U 1327, 0819,0014,0580,09D0,0000,1328   ;3031             ALU_D+K[.1],D_ALU,RC[0A]_ALU ; BEING TESTED
U 1328, 0100,003C,0180,0800,0000,1329   ;3032             D_D.LEFT2,SI/ZERO        ; INITIALIZE THE FLOATING DATA PATTERN
U 1329, 0500,003C,0180,0800,0000,132A   ;3033             D_D.LEFT,SI/ZERO
U 132A, 0001,003C,0180,0A98,0000,132B   ;3034             R[3]_D
U 132B, 0018,0038,8D80,0AA0,0000,10F4   ;3035             R[4]_K[.1F]              ; SET UP A COUNTER FOR THE DATA PATTERNS
U 10F4, 0000,003D,0180,0800,0000,1137   ;3036   =0        ERLOOP
U 10F5, 0000,003C,0180,0A20,0082,132C   ;3037   BAL1B:    SC_R[4]                  ; COMPUTE THE FLOATING DATA PATTERN
U 132C, 0000,0038,01C0,09C8,0000,132D   ;3038             ALU_MASK,RC[9]_ALU,Q_ALU ; AND EXPECTED RESULTS
U 132D, 0F00,003C,0180,0A18,0082,132E   ;3039             SC_R[3],D_0
U 132E, 0D00,003C,0180,0800,0000,132F   ;3040             D_DAL.SC
U 132F, 0001,003C,0180,09E8,0000,1330   ;3041             RC[0D]_D
U 1330, 0C00,003C,01F8,0800,0000,1331   ;3042             D_Q,Q_0
U 1331, 0D00,003C,0180,0800,0000,1332   ;3043             D_DAL.SC
U 1332, 0001,003C,0180,09F0,0000,10F6   ;3044             RC[0E]_D
U 10F6, 0000,003D,0180,0800,0000,1187   ;3045   =0        CALL,J7ROS               ; SET THE FORCE REPLACE GROUP 0 BIT
U 10F7, 0F18,0038,1980,0800,0200,1333   ;3046             VA_K[ZERO],D_0           ; WRITE DATA 00000000 INTO
U 1333, 0000,003C,0180,9800,0000,1334   ;3047             FS7MCT,MCT/VALIDATE      ; GROUP 0
U 1334, 0F00,003C,0180,0803,0000,1335   ;3048             VA_VA+4,D_0              ; WRITE DAT=00000000 INTO
U 1335, 0000,003C,0180,9800,0000,10F8   ;3049             FS7MCT,MCT/VALIDATE      ; GROUP 0 LOCATION 4
U 10F8, 0000,003D,0180,0800,0000,1183   ;3050   =0        CALL,J/SOFF              ; CLEAR FORCE REPLACE BITS
U 10F9, 0010,0038,0180,0950,0200,1336   ;3051             VA_RC[0A]                ; GET TEST ADDRESS
U 1336, 0810,0038,0180,0948,0000,1337   ;3052             D_RC[9]                  ; PUT TEST DATA PATTERN INTO D
U 1337, 0000,003C,0180,0A70,0000,1338   ;3053             LAB_R[0E]
U 1338, 0000,003C,0180,0AF8,0000,1339   ;3054             R[0F]_LA                 ; SET UP THE UTRAP FLAG
U 1339, 0000,003C,0180,3000,0000,133A   ;3055             FS/MCT,MCT/WRITE.V.WCHK  ; TEST INSTRUCTION SHOULD UTRAP
U 133A, 0800,003C,0180,0A78,0000,133B   ;3056             D_R[0F]                  ; SEE IF UTRAP OCCURRED
U 133B, 0003,003C,0180,0AF8,0000,133C   ;3057             R[0F]_0
U 133C, 0000,003C,01C0,0A70,0000,133D   ;3058             Q_R[0E]
U 133D, 001D,2000,0180,0800,0010,133E   ;3059             ALU_Q-D,CLK.UBCC
U 133E, 0000,013C,0180,0800,0000,10FA   ;3060             Z?
U 10FA, 0000,003C,0180,0800,0000,133F   ;3061   =0        J/BAL1C
U 10FB, 0001,003D,0180,09C0,0000,1138   ;3062             ERROR1,RC[8]_D           ; NO UTRAP OCCURRED
U 133F, 0019,0034,0980,0800,0010,1340   ;3063   BAL1C:    ALU_D[AND]K[.2],CLK.UBCC ; SEE IF THE UTRAP WAS BECAUSE
U 1340, 0000,013C,0180,0800,0000,10FC   ;3064             Z?                       ; OF AN ALIGNMENT ERROR
U 10FC, 0001,003D,0180,09C0,0000,1138   ;3065   =0        ERROR1,RC[8]_D           ; UTRAP NOT BECAUSE OF ALIGN
U 10FD, 0000,003C,0180,0803,0000,1341   ;3066             VA_VA+4                  ; INCREMENT THE VA TO 4
                                        ;3067                                      ; TO DO THE SECOND REFERENCE
U 1341, 0810,0038,0180,0948,0000,1342   ;3068             D_RC[9]                  ; SET UP THE TEST DATA PATTERN IN D
U 1342, 0000,003C,0180,0A70,0000,1343   ;3069             LAB_R[0E]
U 1343, 0000,003C,0180,0AF8,0000,1344   ;3070             R[0F]_LA                 ; SET THE UTRAP FLAG
U 1344, 0000,003C,0180,3000,3000,1345   ;3071             FS/MCT,MCT/WRITE.V.WCHK,MSC/SECOND.REF ; TEST INSTRUCTION
U 1345, 0800,003C,0180,0A78,0000,1346   ;3072             D_R[0F]                  ; SEE IF A UTRAP OCCURRED
U 1346, 0003,003C,0180,0AF8,0000,1347   ;3073             R[0F]_0
U 1347, 0000,003C,01C0,0A70,0000,1348   ;3074             Q_R[0E]
U 1348, 001D,2000,0180,0800,0010,1349   ;3075             ALU_Q-D,CLK.UBCC
U 1349, 0000,013C,0180,0800,0000,10FE   ;3076             Z?
U 10FE, 0001,003D,0180,09C0,0000,1138   ;3077   =0        ERROR1,RC[8]_D           ; UTRAPPED
U 10FF, 0018,0038,1980,0800,0200,134A   ;3078             VA_K[ZERO]               ; READ LOCATION 0 TO GET
U 134A, 0000,003C,0180,0A70,0000,134B   ;3079             LAB_R[0E]                ; THE FIRST HALF OF THE RESULT
U 134B, 0000,003C,0180,0AF8,0000,134C   ;3080             R[0F]_LA                 ; SET THE UTRAP FLAG
U 134C, 0000,003C,0180,5000,0000,134D   ;3081             FS/MCT,MCT/READ.V.WCHK   ; GET LOCATION 0 FROM GROUP 0
U 134D, 0001,003C,0180,09E0,0000,134E   ;3082             RC[0C]_D                 ; SAVE THE RESULT
```

```
U 134E, 0800,003C,0180,0A78,0000,134F    ;3083             D_R[OF]                     ; SEE IF A UTRAP OCCURRED
U 134F, 0003,003C,0180,0AF8,0000,1350    ;3084             R[OF]_0
U 1350, 0000,003C,01C0,0A70,0000,1351    ;3085             Q_R[OE]
U 1351, 001D,2000,0180,0800,0010,1352    ;3086             A[U_Q-D,CLK.UBCC
U 1352, 0000,013C,0180,0800,0000,110A    ;3087             Z?
U 110A, 0001,003D,0180,09C0,0000,1138    ;3088     =0      ERROR1,RC[8]_D              ; UTRAPPED
U 110B, 0018,0038,1180,0800,0200,1353    ;3089             VA_K[.4]                    ; GET LOCATION 4, WHICH
U 1353, 0000,003C,0180,0A70,0000,1354    ;3090             LAB_R[OE]                   ; CONTAINS THE SECOND HALF OF THE RESULT
U 1354, 0000,003C,0180,0AF8,0000,1355    ;3091             R[OF]_LA                    ; SET UP THE UTRAP FLAG
U 1355, 0000,003C,0180,5000,0000,1356    ;3092             FS/MCT,MCT/READ.V.WCHK      ; READ LOCATION 4 OF GROUP 0
U 1356, 0001,003C,0180,09D8,0000,1357    ;3093             RC[OB]_D                    ; SAVE THE DATA READ
U 1357, 0800,003C,0180,0A78,0000,1358    ;3094             D_R[OF]                     ; SEE IF A UTRAP OCCURRED
U 1358, 0003,003C,0180,0AF8,0000,1359    ;3095             R[OF]_0
U 1359, 0000,003C,01C0,0A70,0000,135A    ;3096             Q_R[OE]
U 135A, 001D,2000,0180,0800,0010,135B    ;3097             A[U_Q-D,CLK.UBCC
U 135B, 0000,013C,0180,0800,0000,1110    ;3098             Z?
U 1110, 0001,003D,0180,09C0,0000,1138    ;3099     =0      ERROR1,RC[8]_D              ; UTRAPPED
U 1111, 0010,0038,01C0,0970,0000,135C    ;3100             Q_RC[OE]                    ; CHECK THE DATA AT LOCATION 0
U 135C, 0810,0038,0180,0960,0000,135D    ;3101             D_RC[OC]
U 135D, 001D,2000,0180,0800,0010,135E    ;3102             A[U_Q-D,CLK.UBCC
U 135E, 0000,013C,0180,0800,0000,1112    ;3103             Z?
U 1112, 0000,003D,0180,0800,0000,1138    ;3104     =0      ERROR1                      ; DATA AT LOCATION 0 INCORRECT.
U 1113, 0010,0038,01C0,0968,0000,135F    ;3105             Q_RC[OD]                    ; CHECK THE DATA AT LOCATION 4
U 135F, 0810,0038,0180,0958,0000,1360    ;3106             D_RC[OB]
U 1360, 001D,2000,0180,0800,0010,1361    ;3107             A[U_Q-D,CLK.UBCC
U 1361, 0000,013C,0180,0800,0000,1114    ;3108             Z?
U 1114, 0000,003D,0180,0800,0000,1138    ;3109     =0      ERROR1                      ; DATA AT LOCATION 4 INCORRECT.
U 1115, 0000,003C,0180,0A20,0010,1362    ;3110             ALU_R[4],CLK.UBCC           ; SEE IF ALL DATA PATTERNS HAVE BEEN TESTED
U 1362, 0000,013C,0180,0800,0000,1116    ;3111             Z?
U 1116, 0018,0000,0580,0AA0,0000,10F5    ;3112     =0      R[4]_LA-K[.1],J/BAL1B       ; IF NOT CONTINUE WITH NEXT PATTERN
U 1117, 0000,003C,0180,0A38,0010,1363    ;3113             ALU_R[7],CLK.UBCC           ; SEE IF EACH OF THE ADDRESSES 3, 2 AND 1
U 1363, 0000,013C,0180,0800,0000,1118    ;3114             Z?                          ; HAS BEEN TESTED.
U 1118, 0018,0000,0580,0AB8,0000,1326    ;3115     =0      R[7]_LA-K[.1],J/BAL1A       ; IF NOT TEST NEXT ADDRESS
U 1119, 0000,003C,0180,0800,0000,111A    ;3116             NOP
                                         ;3117     =0
U 111A, 0000,003D,0180,0800,0000,1124    ;3118     DUMMY1: NEWTST
```

```
;                               Location / Line Number Index

;Location          0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000             1871:    1838     1845=    1861=    2254=    2255=    2256=    2257=
U 1008             2267=    2268=    2269=    2270=    2409=    2410=    2411=    2412=
U 1010             2422=    2423=    2424=    2425=    1862=    1863=    1952=    1953=
U 1018             1954=    1955=    1980=    1981=    1983=    1984=    1986=    1987=
U 1020             1990=    1991=    1993=    1994=    1996=    1997=    2000=    2001=
U 1028             2004=    2005=    2022=    2023=    2025=    2026=    2035=    2036=
U 1030             2038=    2039=    2041=    2042=    2044=    2045=    2059=    2060=
U 1038             2067=    2068=    2081=    2082=    2129=    2130=    2132=    2133=
U 1040             2137=    2138=    2140=    2141=    2152=    2153=    2154=    2155=
U 1048             2156=    2157=    2211=    2212=    2213=    2214=    1902:    1839
U 1050             2217=    2218=    2222=    2223=    2225=    2226=    2230=    2231=
U 1058             2260=    2261=    1905:    1840     2264=    2265=    1908:    1841
U 1060             2273=    2274=    2276=    2277=    2280=    2281=    2286=    2287=
U 1068             2294=    2295=    2299=    2300=    2306=    2307=    2310=    2311=
U 1070             2315=    2316=    2366=    2367=    2368=    2369=    2372=    2373=
U 1078             2377=    2378=    2380=    2381=    2385=    2386=    2415=    2416=
U 1080             2419=    2420=    2428=    2429=    2431=    2432=    2435=    2436=
U 1088             2441=    2442=    2449=    2450=    2454=    2455=    2461=    2462=
U 1090             2465=    2466=    2470=    2471=    2524=    2525=    2526=    2527=
U 1098             2528=    2529=    2538=    2539=    2550=    2551=    2555=    2556=
U 10A0             2575=    2576=    2579=    2580=    2592=    2593=    2606=    2607=
U 10A8             2614=    2615=    2622=    2623=    2633=    2634=    2682=    2683=
U 10B0             2684=    2685=    2686=    2687=    2693=    2694=    2702=    2703=
U 10B8             2707=    2708=    2726=    2727=    2730=    2731=    2737=    2738=
U 10C0             2749=    2750=    2757=    2758=    2765=    2766=    2809=    2810=
U 10C8             2811=    2812=    2813=    2814=    2818=    2819=    2828=    2829=
U 10D0             2832=    2833=    2849=    2850=    2856=    2857=    2861=    2862=
U 10D8             2868=    2869=    2912=    2913=    2914=    2915=    2916=    2917=
U 10E0             2921=    2922=    2931=    2932=    2935=    2936=    2952=    2953=
U 10E8             2959=    2960=    2964=    2965=    2971=    2972=    3019=    3020=
U 10F0             3021=    3022=    3024=    3025=    3036=    3037=    3045=    3046=
U 10F8             3050=    3051=    3061=    3062=    3065=    3066=    3077=    3078=
U 1100             1825:    1826:    1827:    1828:    1829:    1830:    1831:    1832:
U 1108             1833:    1842     3088=    3089=    1834:    1835:    1836:    1837:
U 1110             3099=    3100=    3104=    3105=    3109=    3110=    3112=    3113=
U 1118             3115=    3116=    3118=    1843     1844     1864     1865     1866
U 1120             1867     1868     1869     1870     1880     1881     1882     1883
U 1128             1884     1885     1886     1887     1888     1889     1890     1891
U 1130             1892     1893     1894     1895     1896     1897     1898     1899
U 1138             1900     1901     1903     1904     1936     1937     1943     1944
U 1140             1945     1950     1951     1957     1958     1959     1960     1961
U 1148             1962     1963     1964     1965     1966     1967     1968     1969
U 1150             1970     1971     1972     1973     1974     1928:    1975     1976
U 1158             1977     1978     1982     1988     1992     1998     2002     2006
U 1160             2010     2020     2024     2046     2047     2048     2049     2050
U 1168             2051     2052     2053     2054     2055     2056     2057     2058
U 1170             2061     2062     2063     2064     2065     2066     2069     2070
U 1178             2074     2075     2076     2077     2011:    2012:    2013:    2014:
U 1180             2078     2079     2080     2088     2089     2090     2091     2093
U 1188             2094     2095     2096     2098     2099     2101     2102     2104
U 1190             2105     2107     2108     2109     2111     2112     2113     2115
U 1198             2127     2131     2134     2135     2139     2142     2143     2144
```

```
;Location       0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0          2145    2146    2147    2148    2149    2150    2151    2158
U 11A8          2159    2160    2161    2162    2163    2164    2165    2166
U 11B0          2215    2216    2219    2220    2224    2227    2228    2229
U 11B8          2232    2233    2234    2235    2236    2237    2238    2239
U 11C0          2240    2241    2242    2243    2244    2245    2246    2247
U 11C8          2248    2249    2250    2251    2252    2253    2258    2259
U 11D0          2262    2263    2266    2271    2272    2275    2278    2279
U 11D8          2282    2283    2284    2285    2288    2289    2290    2291
U 11E0          2292    2293    2296    2297    2298    2301    2302    2303
U 11E8          2304    2305    2308    2309    2312    2313    2314    2317
U 11F0          2318    2319    2320    2321    2370    2371    2374    2375
U 11F8          2379    2382    2383    2384    2015:   2016:   2017:   2018:
U 1200          2387    2388    2389    2390    2391    2392    2393    2394
U 1208          2395    2396    2397    2398    2399    2400    2401    2402
U 1210          2403    2404    2405    2406    2407    2408    2413    2414
U 1218          2417    2418    2421    2426    2427    2430    2433    2434
U 1220          2437    2438    2439    2440    2443    2444    2445    2446
U 1228          2447    2448    2451    2452    2453    2456    2457    2458
U 1230          2459    2460    2463    2464    2467    2468    2469    2472
U 1238          2473    2474    2475    2476    2530    2531    2532    2533
U 1240          2534    2535    2536    2537    2540    2541    2542    2543
U 1248          2544    2545    2546    2547    2548    2549    2552    2553
U 1250          2554    2557    2558    2559    2560    2561    2562    2563
U 1258          2564    2565    2566    2567    2568    2569    2570    2571
U 1260          2572    2573    2574    2577    2578    2581    2582    2583
U 1268          2584    2585    2586    2587    2588    2589    2590    2591
U 1270          2594    2595    2596    2597    2598    2599    2600    2601
U 1278          2602    2603    2604    2605    2608    2609    2610    2611
U 1280          2612    2613    2616    2617    2618    2619    2620    2621
U 1288          2624    2625    2626    2627    2628    2629    2630    2631
U 1290          2632    2688    2689    2690    2691    2692    2695    2696
U 1298          2697    2698    2699    2700    2701    2704    2705    2706
U 12A0          2709    2710    2711    2712    2713    2714    2715    2716
U 12A8          2717    2718    1929:   2719    2720    2721    2722    2723
U 12B0          2724    2725    2728    2729    2732    2733    2734    2735
U 12B8          2736    2739    2740    2741    2742    2743    2744    2745
U 12C0          2746    2747    2748    2751    2752    2753    2754    2755
U 12C8          2756    2759    2760    2761    2762    2763    2764    2815
U 12D0          2816    2817    2820    2821    2822    2823    2824    2825
U 12D8          2826    2827    2830    2831    2834    2835    2836    2837
U 12E0          2838    2839    2840    2841    2842    2843    2844    2845
U 12E8          2846    2847    2848    2851    2852    2853    2854    2855
U 12F0          2858    2859    2860    2863    2864    2865    2866    2867
U 12F8          2918    2919    2920    2923    2924    2925    2926    2927
U 1300          2928    2929    2930    2933    2934    2937    2938    2939
U 1308          2940    2941    2942    2943    2944    2945    2946    2947
U 1310          2948    2949    2950    2951    2954    2955    2956    2957
U 1318          2958    2961    2962    2963    2966    2967    2968    2969
U 1320          2970    3023    3026    3027    3028    3029    3030    3031
U 1328          3032    3033    3034    3035    3038    3039    3040    3041
U 1330          3042    3043    3044    3047    3048    3049    3052    3053
U 1338          3054    3055    3056    3057    3058    3059    3060    3063
U 1340          3064    3068    3069    3070    3071    3072    3073    3074
```

```
;Location         0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 1348            3075     3076     3079     3080     3081     3082     3083     3084
U 1350            3085     3086     3087     3090     3091     3092     3093     3094
U 1358            3095     3096     3097     3098     3101     3102     3103     3106
U 1360            3107     3108     3111     3114
U 1368 - 13EF Unused
U 13F0            1912:    1913:    1914:    1915:    1916:    1917:    1918:    1919:
U 13F8            1920:    1921:    1922:    1923:    1924:    1925:    1926:    1927:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH30        884

Used             884
Remaining

Total microwords used in memory U: 884
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH30.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 1806  MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2167  TEST EC BAL TEST 2
; 2301  TEST ED BAL TEST 3
; 2423  TEST EE BAL TEST 4
; 2548  TEST EF BAL TEST 5
```

```
                                        ;1      .NOLIST
                                        ;1804   .LIST
                                        ;1805
```

```
                                           ;1806           .TOC    "MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES"
                                           ;1807    .REGION/1000,13FF
                                           ;1808    ;+
                                           ;1809    ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                           ;1810    ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                           ;1811    ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                           ;1812    ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                           ;1813    ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                           ;1814    ;
                                           ;1815    ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                           ;1816    ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                           ;1817    ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                           ;1818    ;       R[OF] AND DO A RETURNO.
                                           ;1819    ;
                                           ;1820    ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                           ;1821    ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                           ;1822    ; TO THE CONSOLE.
                                           ;1823    ;
                                           ;1824    ;-
U 1100, 0000,003C,1980,0800,0084,7003      ;1825    1100:   SC_K[ZERO],J/TRPH1       ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001      ;1826    1101:   SC_K[.1],J/TRPH0         ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001      ;1827    1102:   SC_K[.2],J/TRPH0         ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001      ;1828    1103:   SC_K[.3],J/TRPH0         ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001      ;1829    1104:   SC_K[.4],J/TRPH0         ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001      ;1830    1105:   SC_K[.6],J/TRPH0         ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001      ;1831    1106:   SC_K[.9],J/TRPH0         ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001      ;1832    1107:   SC_K[.7],J/TRPH0         ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001      ;1833    1108:   SC_K[.8],J/TRPH0         ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003      ;1834    110C:   SC_K[.C],J/TRPH1         ; RDS
U 110D, 0000,003C,8980,0800,0084,7003      ;1835    110D:   SC_K[.D],J/TRPH1         ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001      ;1836    110E:   SC_K[.10],J/TRPH0        ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003      ;1837    110F:   SC_K[.F],J/TRPH1         ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,104F      ;1838    TRPH0:  Q_ID[USTACK]
U 104F, 0C00,003C,01E0,0800,0000,105B      ;1839            Q_D,D_Q
U 105B, 0000,003C,8180,3C00,0000,105F      ;1840            ID[USTACK]_D
U 105F, 0C00,003C,01E0,0800,0000,10AB      ;1841            Q_D,D_Q
U 10AB, 0000,003C,01C0,0A78,0000,10AC      ;1842            Q_R[OF]
U 10AC, 0001,2024,0180,0800,0010,10AD      ;1843            A[U_Q.ANDNOT.MASK,CLK.UBCC       ; WAS TRAP EXPECTED?
U 10AD, 0000,013C,0180,0800,0000,1002      ;1844            Z?                               ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000      ;1845    =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN
                                           ;1846    ;+
                                           ;1847    ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                           ;1848    ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                           ;1849    ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                           ;1850    ;
                                           ;1851    ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                           ;1852    ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                           ;1853    ;             FAULT STATUS REGISTER
                                           ;1854    ;             SBI ERROR REGISTER
                                           ;1855    ;             TIMEOUT ADDRESS REGISTER
                                           ;1856    ;             MAINTENANCE REGISTER
                                           ;1857    ;             CACHE PARITY REGISTER
                                           ;1858    ;             TB ERROR REGISTER 1
                                           ;1859    ;             TB ERROR REGISTER 0
                                           ;1860    ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,1004     ;1861    TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,70CF     ;1862    =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,10AE     ;1863            Q_ID[TBER0]
U 10AE, 0001,203C,4DF0,2DB0,0000,10AF     ;1864            RC[6]_Q,Q_ID[TBER1]
U 10AF, 0001,203C,65F0,2DB8,0000,10B0     ;1865            RC[7]_Q,Q_ID[SBI.ERR]
U 10B0, 0001,203C,6DF0,2DD8,0000,10B1     ;1866            RC[0B]_Q,Q_ID[FAULT]
U 10B1, 0001,203C,75F0,2DE0,0000,10B2     ;1867            RC[0C]_Q,Q_ID[MAINT]
U 10B2, 0001,203C,79F0,2DC8,0000,10B3     ;1868            RC[9]_Q,Q_ID[PARITY]
U 10B3, 0001,203C,69F0,2DC0,0000,10B4     ;1869            RC[8]_Q,Q_ID[TIME.ADDR]
U 10B4, 0001,203C,81F0,2DD0,0000,1000     ;1870            RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,10C9     ;1871    1000:   RC[0E]_Q,ERROR1
                                          ;1872    ;+
                                          ;1873    ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                          ;1874    ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                          ;1875    ;                NEWTST
                                          ;1876    ;                ERLOOP
                                          ;1877    ;                ERROR1
                                          ;1878    ;                ERROR2
                                          ;1879    ;
U 10B5, 0000,003C,65F8,0800,0084,70B6     ;1880    SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 10B6, 0818,0038,8D80,0800,0000,10B7     ;1881            D_K[.1F]                        ; ...
U 10B7, 0D00,003C,0180,0800,0000,10B8     ;1882            D_DAL.SC
U 10B8, 0000,003C,3D80,3C00,0000,10B9     ;1883            ID[PSL]_D                       ; WRITE THE PSL
U 10B9, 0818,0038,0580,0800,0000,10BA     ;1884            D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 10BA, 0D00,003C,0180,0800,0000,10BB     ;1885            D_DAL.SC
U 10BB, 0F00,003C,3180,3C00,0000,10BC     ;1886            ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 10BC, 0000,003C,5D80,3C00,0000,10BD     ;1887            ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 10BD, 0000,003C,3980,3C00,0000,10BE     ;1888            ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 10BE, 0000,003C,2980,3C00,0000,10BF     ;1889            ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 10BF, 0000,003C,4980,3C00,0000,10C0     ;1890            ID[TBER0]_D                     ; SHUT OFF THE TB
U 10C0, 0818,0038,C180,0800,0000,10C1     ;1891            D_K[.FFFF]
U 10C1, 0000,003C,6580,3C00,0000,10C2     ;1892            ID[SBI.ERR]_D
U 10C2, 0F00,003C,6D80,3C00,0000,10C3     ;1893            ID[FAULT]_D,D_0
U 10C3, 0000,003C,6D80,3C00,0000,10C4     ;1894            ID[FAULT]_D
U 10C4, 0000,003C,6580,3C00,0000,10C5     ;1895            ID[SBI.ERR]_D
U 10C5, 0003,003C,0180,09F0,0000,10C6     ;1896            RC[0E]_0
U 10C6, 0003,003C,0180,0AF8,0000,10C7     ;1897            R[0F]_0
U 10C7, 0003,003C,0180,09E8,0000,105E     ;1898            RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 10C8, 0818,0038,0980,0800,0000,105E     ;1899    ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 10C9, 0810,0038,0180,0978,0000,10CA     ;1900    ERROR1: D_RC[0F]
U 10CA, 0819,0034,4D80,0800,0000,104E     ;1901            D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E     ;1902    104E:   D_D.OR.K[.4],J/CALLCON
U 10CB, 0810,0038,0180,0978,0000,10CC     ;1903    ERROR2: D_RC[0F]
U 10CC, 0819,0034,4D80,0800,0000,105A     ;1904            D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E     ;1905    105A:   D_D.OR.K[.6],J/CALLCON
                                          ;1906    105E:
                                          ;1907    CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E     ;1908            ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                          ;1909    ;+
                                          ;1910    ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                          ;1911    ;-
U 13F0, 0000,003C,0180,0800,0000,13F1     ;1912    13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2     ;1913    13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3     ;1914    13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4     ;1915    13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,10CD   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 10CD, 0810,0038,4D80,0978,0000,10CE   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 10CE, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 10CF, 0010,0038,01C0,0978,0000,10D0   ;1943   SETRCF: Q_RC[OF]
U 10D0, 0019,2034,4DC0,0800,0000,10D1   ;1944           Q_Q.AND.K[.FF00]
U 10D1, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946
                                        ;1947   ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                        ;1948   ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                        ;1949   ; CERTAIN TRAPS.
U 10D2, 0018,0038,C180,0800,0000,10D3   ;1950   DC.1DE: ALU_K[.FFFF]
U 10D3, 0500,003C,0380,0800,0000,1006   ;1951           D_D.LEFT,SI/7
U 1006, 0000,003D,0180,0800,0000,10E5   ;1952   =0      CALL,J/DCD
U 1007, 0000,003C,0180,0800,0000,1008   ;1953           NOP
U 1008, 0000,003D,0180,0800,0000,10E6   ;1954   =0      CALL,J/DCE
U 1009, 0000,003E,0180,0800,0000,0001   ;1955           RETURN1
                                        ;1956   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 10D4, 0118,0038,1B80,0800,0000,10E8   ;1957   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 10D5, 0118,0038,0B80,0800,0000,10E8   ;1958   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 10D6, 0118,0038,0780,0800,0000,10E8   ;1959   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 10D7, 0118,0038,C380,0800,0000,10E8   ;1960   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 10D8, 0018,0038,1980,0800,0000,10D4   ;1961   DC0:    ALU_0(K),J/S00
U 10D9, 0018,0038,1980,0800,0000,10D5   ;1962   DC1:    ALU_0(K),J/S01
U 10DA, 0018,0038,1980,0800,0000,10D6   ;1963   DC2:    ALU_0(K),J/S10
U 10DB, 0018,0038,1980,0800,0000,10D7   ;1964   DC3:    ALU_0(K),J/S11
U 10DC, 0018,0038,0980,0800,0000,10D4   ;1965   DC4:    ALU_K[.2],J/S00
U 10DD, 0018,0038,0980,0800,0000,10D5   ;1966   DC5:    ALU_K[.2],J/S01
U 10DE, 0018,0038,0980,0800,0000,10D6   ;1967   DC6:    ALU_K[.2],J/S10
U 10DF, 0018,0038,0980,0800,0000,10D7   ;1968   DC7:    ALU_K[.2],J/S11
U 10E0, 0018,0038,0580,0800,0000,10D4   ;1969   DC8:    ALU_K[.1],J/S00
U 10E1, 0018,0038,0580,0800,0000,10D5   ;1970   DC9:    ALU_K[.1],J/S01
```

```
U 10E2, 0018,0038,0580,0800,0000,10D6     ;1971    DCA:     ALU_K[.1],J/S10
U 10E3, 0018,0038,0580,0800,0000,10D7     ;1972    DCB:     ALU_K[.1],J/S11
U 10E4, 0018,0038,C180,0800,0000,10D4     ;1973    DCC:     ALU_K[.FFFF],J/S00
U 10E5, 0018,0038,C180,0800,0000,10D5     ;1974    DCD:     ALU_K[.FFFF],J/S01
U 10E6, 0018,0038,C180,0800,0000,10D6     ;1975    DCE:     ALU_K[.FFFF],J/S10
U 10E7, 0018,0038,C180,0800,0000,10D7     ;1976    DCF:     ALU_K[.FFFF],J/S11
U 10E8, 0100,003E,0380,0800,0000,0001     ;1977    SX:      D_D.LEFT2,SI/7,RETURN1
U 10E9, 0018,0038,01C0,0800,0000,100A     ;1978    DC.5:    Q_K[.8]
                                          ;1979    =0
U 100A, 0000,003D,0180,0800,0000,10DD     ;1980    DC.5A:   CALL,J/DC5
U 100B, 0019,2000,05C0,0800,0010,10EA     ;1981             ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 10EA, 0000,013C,0180,0800,0000,100C     ;1982             Z?
U 100C, 0000,003C,0180,0800,0000,100A     ;1983    =0       J/DC.5A
U 100D, 0000,003E,0180,0800,0000,0001     ;1984             RETURN1
                                          ;1985    =0
U 100E, 0000,003D,0180,0800,0000,10E9     ;1986    DC.A:    CALL,J/DC.5
U 100F, 0500,003E,0180,0800,0000,0001     ;1987             D_D.LEFT,SI/ZERO,RETURN1
U 10EB, 0018,0038,01C0,0800,0000,1010     ;1988    DC.9:    Q_K[.8]
                                          ;1989    =0
U 1010, 0000,003D,0180,0800,0000,10E1     ;1990    DC.9A:   CALL,J/DC9
U 1011, 0019,2000,05C0,0800,0010,10EC     ;1991             ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 10EC, 0000,013C,0180,0800,0000,1012     ;1992             Z?
U 1012, 0000,003C,0180,0800,0000,1010     ;1993    =0       J/DC.9A
U 1013, 0000,003E,0180,0800,0000,0001     ;1994             RETURN1
                                          ;1995    =0
U 1014, 0000,003D,0180,0800,0000,10EB     ;1996    DC.C:    CALL,J/DC.9
U 1015, 0018,0038,C180,0800,0000,10ED     ;1997             ALU_K[.FFFF]
U 10ED, 0600,003E,0380,0800,0000,0001     ;1998             D_D.RIGHT,SI/7,RETURN1
                                          ;1999    =0
U 1016, 0000,003D,0180,0800,0000,10EB     ;2000    DC.6:    CALL,J/DC.9
U 1017, 0018,0038,0580,0800,0000,10EE     ;2001             ALU_K[.1]
U 10EE, 0100,003E,0380,0800,0000,0001     ;2002             D_D.LEFT2,SI/7,RETURN1
                                          ;2003    =0
U 1018, 0000,003D,0180,0800,0000,10EB     ;2004    DC.3:    CALL,J/DC.9
U 1019, 0018,0038,C180,0800,0000,10EF     ;2005             ALU_K[.FFFF]
U 10EF, 0500,003E,0380,0800,0000,0001     ;2006             D_D.LEFT,SI/7,RETURN1
                                          ;2007    ; THIS IS A TARGET SUBROUTINE FOR CALL 3'S WHICH ARE EXECUTED
                                          ;2008    ; WITHOUT IRD TO TEST IBUF INITIATED FUNCTIONS IN THE TB
                                          ;2009    ; WHICH COULD RESULT IN ERROR CONDITIONS.
U 10F0, 0000,003F,0180,0800,0000,117C     ;2010    TARGC3: SUB/SPEC
U 117C, 0000,003E,0180,0800,0000,0001     ;2011    117C:    RETURN1
U 117D, 0000,003E,0180,0800,0000,0002     ;2012    117D:    RETURN2
U 117E, 0000,003E,0180,0800,0000,0003     ;2013    117E:    RETURN3
U 117F, 0000,003E,0180,0800,0000,0004     ;2014    117F:    RETURN4
U 11FC, 0000,003D,0180,0800,0000,10C9     ;2015    11FC:    ERROR1
U 11FD, 0000,003D,0180,0800,0000,10C9     ;2016    11FD:    ERROR1
U 11FE, 0000,003D,0180,0800,0000,10C9     ;2017    11FE:    ERROR1
U 11FF, 0000,003D,0180,0800,0000,10C9     ;2018    11FF:    ERROR1
                                          ;2019    ; THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAAA IN THE D REGISTER.
U 10F1, 0F18,0038,5DC0,0800,0000,101A     ;2020    DCLA:    D_0,Q_K[.7]
                                          ;2021    =0
U 101A, 0000,003D,0180,0800,0000,10E2     ;2022    DCLA1:   CALL,J/DCA
U 101B, 0001,203C,0180,0800,0010,10F2     ;2023             ALU_Q,CLK.UBCC
U 10F2, 0000,013C,0180,0800,0000,101C     ;2024             Z?
U 101C, 0019,2000,05C0,0800,0000,101A     ;2025    =0       Q_Q-K[.1],J/DCLA1
```

```
U 101D, 0000,003E,0180,0800,0000,0001   ;2026          RETURN1
                                        ;2027   ; THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
                                        ;2028   ; THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
                                        ;2029   ; IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED, IF NO
                                        ;2030   ; UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
                                        ;2031   ; IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
                                        ;2032   ; TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
                                        ;2033   ; WILL CONTAIN THE READ DATA.
                                        ;2034   =0
U 101E, 0F00,003D,0180,0800,0000,10DE   ;2035   RHOH1:  D_0,CALL,J/DC6
U 101F, 0000,003C,0180,0800,0000,1025   ;2036           J7READ
                                        ;2037   =0
U 1020, 0F00,003D,0180,0800,0000,10DA   ;2038   RHOM1:  D_0,CALL,J/DC2
U 1021, 0000,003C,0180,0800,0000,1025   ;2039           J7READ
                                        ;2040   =0
U 1022, 0F00,003D,0180,0800,0000,10DC   ;2041   RMOH1:  D_0,CALL,J/DC4
U 1023, 0000,003C,0180,0800,0000,1025   ;2042           J7READ
                                        ;2043   =0
U 1024, 0F00,003C,0180,0800,0000,1025   ;2044   RMOM1:  D_0,J/READ
U 1025, 0000,003C,01F8,0800,0084,70F3   ;2045   READ:   SC_K[.8],Q_0            ; CALCULATE THE EXPECTED HIT/MISS BITS
U 10F3, 0D00,003C,0180,0800,0000,10F4   ;2046           D_DAL.SC
U 10F4, 0001,003C,0180,09E8,0000,10F5   ;2047           RC[0D]_D
U 10F5, 0000,003C,0180,0A70,0000,10F6   ;2048           LAB_R[0E]
U 10F6, 0000,003C,0180,52F8,0000,10F7   ;2049           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK
U 10F7, 0001,003C,0180,09D0,0000,10F8   ;2050           RC[0A]_D
U 10F8, 0000,003C,75F0,2C00,0000,10F9   ;2051           Q_ID[MAINT]
U 10F9, 0800,003C,0180,0A78,0000,10FA   ;2052           D_R[0F]
U 10FA, 0003,003C,0180,0AF8,0000,10FB   ;2053           R[0F]_0
U 10FB, 0001,203C,0180,09E0,0000,10FC   ;2054           RC[0C]_Q
U 10FC, 0000,003C,01C0,0A70,0000,10FD   ;2055           Q_R[0E]
U 10FD, 0001,003C,0180,09C8,0000,10FE   ;2056           RC[9]_D
U 10FE, 001D,2000,0180,0800,0010,10FF   ;2057           ALU_Q-D,CLK.UBCC
U 10FF, 0000,013C,0180,0800,0000,1026   ;2058           Z?
U 1026, 0000,003C,0180,0800,0000,1113   ;2059   =0      J/RERR
U 1027, 0818,0038,D5F8,0800,0000,1109   ;2060           Q_0,D_K[.6]
U 1109, 0000,003C,0180,0800,0084,710A   ;2061           SC_K[.8]
U 110A, 0D10,0038,01C0,0960,0000,110B   ;2062           D_DAL.SC,Q_RC[0C]
U 110B, 001D,2034,01C0,0800,0000,1110   ;2063           ALU_Q[AND]D,Q_ALU
U 1110, 0810,0038,0180,0968,0000,1111   ;2064           D_RC[0D]
U 1111, 001D,2000,0180,0800,0010,1112   ;2065           ALU_Q-D,CLK.UBCC
U 1112, 0000,013C,0180,0800,0000,1028   ;2066           Z?
U 1028, 0000,003E,0180,0800,0000,0002   ;2067   =0      RETURN2
U 1029, 0810,003A,0180,0950,0000,0003   ;2068           D_RC[0A],RETURN3
U 1113, 0000,003C,79F0,2C00,0000,1114   ;2069   RERR:   Q_ID[PARITY]
U 1114, 0001,203E,0180,09E8,0000,0001   ;2070           RC[0D]_Q,RETURN1
                                        ;2071   ; THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
                                        ;2072   ; AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
                                        ;2073   ; ELSE RETURN2.
U 1115, 0000,003C,0180,0A70,0000,1116   ;2074   WRITE:  LAB_R[0E]
U 1116, 0000,003C,0180,32F8,0000,1117   ;2075           R[0F]_LA,FS/MCT,MCT/WRITE.V.WCHK
U 1117, 0800,003C,0180,0A78,0000,1118   ;2076           D_R[0F]
U 1118, 0003,003C,0180,0AF8,0000,1119   ;2077           R[0F]_0
U 1119, 0000,003C,01C0,0A70,0000,111A   ;2078           Q_R[0E]
U 111A, 001D,2000,0180,0800,0010,111B   ;2079           ALU_Q-D,CLK.UBCC
U 111B, 0000,013C,0180,0800,0000,102A   ;2080           Z?
```

```
U 102A, 0000,003C,0180,0800,0000,1113   ;2081   =0      J/RERR                  ; UTRAPPED.
U 102B, 0000,003E,0180,0800,0000,0002   ;2082           RETURN2                 ; OK NO UTRAP.
                                        ;2083   ; THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
                                        ;2084   ; REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
                                        ;2085   ; CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
                                        ;2086   ; NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
                                        ;2087   ; DISSABLE SBI CYCLES:
U 111C, 0F00,003C,0180,0800,0000,111D   ;2088   SOFF:   D_0
U 111D, 0000,003C,8580,0800,0084,711E   ;2089   S1:     SC_K[.C]
U 111E, 0801,001C,0180,0800,0000,111F   ;2090           ALU_D.ORNOT.MASK,D_ALU
U 111F, 0000,003E,7580,3C00,0000,0001   ;2091           ID[MAINT]_D,RETURN1
                                        ;2092   ; SET FORCE REPLACE GROUP ZERO BIT
U 1120, 0F00,003C,0180,0800,0000,1121   ;2093   R0S:    D_0
U 1121, 0000,003C,6180,0800,0084,7122   ;2094   S2:     SC_K[.F]
U 1122, 0000,003C,0580,0800,0084,B123   ;2095           SC_SC-K[.1]
U 1123, 0801,001C,0180,0800,0000,111D   ;2096   S3:     ALU_D.ORNOT.MASK,D_ALU,J/S1
                                        ;2097   ; SET FORCE REPLACE GROUP 1 BIT
U 1124, 0F00,003C,0180,0800,0000,1125   ;2098   R1S:    D_0
U 1125, 0000,003C,8980,0800,0084,7123   ;2099   S4:     SC_K[.D],J/S3
                                        ;2100   ; SET FORCE MISS GROUP 0 BIT
U 1126, 0F00,003C,0180,0800,0000,1127   ;2101   M0S:    D_0
U 1127, 0000,003C,6580,0800,0084,7123   ;2102   S5:     SC_K[.10],J/S3
                                        ;2103   ; SET FORCE MISS GROUP 1 BIT
U 1128, 0F00,003C,0180,0800,0000,1129   ;2104   M1S:    D_0
U 1129, 0000,003C,6180,0800,0084,7123   ;2105   S6:     SC_K[.F],J/S3
                                        ;2106   ; SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
U 112A, 0F00,003C,0180,0800,0000,112B   ;2107   M10S:   D_0
U 112B, 0000,003C,6180,0800,0084,712C   ;2108           SC_K[.F]
U 112C, 0801,001C,0180,0800,0000,1127   ;2109   S7:     ALU_D.ORNOT.MASK,D_ALU,J/S5
                                        ;2110   ; SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
U 112D, 0F00,003C,0180,0800,0000,112E   ;2111   R0M1S:  D_0
U 112E, 0000,003C,6180,0800,0084,712F   ;2112           SC_K[.F]
U 112F, 0801,001C,0180,0800,0000,1121   ;2113           ALU_D.ORNOT.MASK,D_ALU,J/S2
                                        ;2114   ; SET FORCE REPLACE GROUP 1 FORCE MISS GROUP 0 BITS
U 1130, 0F00,003C,8980,0800,0084,712C   ;2115   R1M0S:  D_0,SC_K[.D],J/S7
                                        ;2116   ; THIS SUBROUTINE IS CALLED TO GENERATE SOME BASIC DATA AND ADDRESS
                                        ;2117   ; PATTERNS WHICH ARE USED BY MANY OF THE CACHE TESTS. IT LEAVES
                                        ;2118   ; THESE PATTERNS IN THE RC SCRATCH PADS.
                                        ;2119   ;       RC[0]           AAAAAAAA
                                        ;2120   ;       RC[1]           19999000
                                        ;2121   ;       RC[2]           55555555
                                        ;2122   ;       RC[3]           06666000
                                        ;2123   ;       RC[4]           99999999
                                        ;2124   ;       RC[5]           1B6DB000
                                        ;2125   ;       RC[6]           66666666
                                        ;2126   ;       RC[7]           04924000
U 1131, 0F18,0038,5DC0,0800,0000,102C   ;2127   CAPAT:  Q_K[.7],D_0
                                        ;2128   =0
U 102C, 0000,003D,0180,0800,0000,10E2   ;2129   CAP1:   CALL,J/DCA
U 102D, 0001,203C,0180,0800,0010,1132   ;2130           ALU_Q,CLK.UBCC
U 1132, 0000,013C,0180,0800,0000,102E   ;2131           Z?
U 102E, 0019,2000,05C0,0800,0000,102C   ;2132   =0      Q_Q-K[.1],J/CAP1
U 102F, 0001,003C,0180,0980,0000,1133   ;2133           RC[0]_D
U 1133, 0001,0028,0180,0990,0000,1134   ;2134           ALU_NOT.D,RC[2]_ALU
U 1134, 0F18,0038,5DC0,0800,0000,1030   ;2135           Q_K[.7],D_0
```

```
                                        ;2136   =0
U 1030, 0000,003D,0180,0800,0000,10E1   ;2137   CAP2:   CALL,J/DC9
U 1031, 0001,203C,0180,0800,0010,1135   ;2138           ALU_Q,CLK.UBCC
U 1135, 0000,013C,0180,0800,0000,1032   ;2139           Z?
U 1032, 0019,2000,05C0,0800,0000,1030   ;2140   =0      Q_Q-K[.1],J/CAP2
U 1033, 0001,003C,0180,09A0,0000,1136   ;2141           RC[4]_D
U 1136, 0001,0028,0180,09B0,0000,1137   ;2142           ALU_NOT.D,RC[6]_ALU
U 1137, 0000,003C,89F8,0800,0084,7138   ;2143           Q_0,SC_K[.D]
U 1138, 0D00,003C,0180,0800,0000,1139   ;2144           D_DAL.SC
U 1139, 0600,003C,0180,0800,0000,113A   ;2145           D_D.RIGHT,SI/ZERO
U 113A, 0001,003C,0180,0988,0000,113B   ;2146           RC[1]_D
U 113B, 0810,0038,65F8,0930,0084,713C   ;2147           D_RC[6],SC_K[.10],Q_0
U 113C, 0D00,003C,0180,0800,0000,113D   ;2148           D_DAL.SC
U 113D, 0200,003C,0180,0800,0000,113E   ;2149           D_D.RIGHT2,SI/ZERO
U 113E, 0200,003C,0180,0800,0000,113F   ;2150           D_D.RIGHT2,SI/ZERO
U 113F, 0F01,003C,0180,0998,0000,1034   ;2151           RC[3]_D,D_0
U 1034, 0000,003D,0180,0800,0000,10E1   ;2152   =0      CALL,J/DC9
U 1035, 0100,003C,0180,0800,0000,1036   ;2153           D_D.LEFT2,SI/ZERO
U 1036, 0000,003D,0180,0800,0000,10E1   ;2154   =0      CALL,J/DC9
U 1037, 0500,003C,0180,0800,0000,1038   ;2155           D_D.LEFT,SI/ZERO
U 1038, 0000,003D,0180,0800,0000,10DC   ;2156   =0      CALL,J/DC4
U 1039, 0001,0028,0180,09A8,0000,1140   ;2157           ALU_NOT.D,RC[5]_ALU
U 1140, 0000,003C,85F8,0800,0084,7141   ;2158           SC_K[.C],Q_0
U 1141, 0D00,003C,0180,0800,0000,1142   ;2159           D_DAL.SC
U 1142, 0001,003C,0180,09B8,0000,1143   ;2160           RC[7]_D
U 1143, 0810,0038,0180,0928,0000,1144   ;2161           D_RC[5]
U 1144, 0000,003C,61F8,0800,0084,7145   ;2162           SC_K[.F],Q_0
U 1145, 0D00,003C,0180,0800,0000,1146   ;2163           D_DAL.SC
U 1146, 0200,003C,0180,0800,0000,1147   ;2164           D_D.RIGHT2,SI/ZERO
U 1147, 0600,003C,0180,0800,0000,1148   ;2165           D_D.RIGHT,SI/ZERO
U 1148, 0001,003E,0180,09A8,0000,0001   ;2166           RC[5]_D,RETURN1
```

```
                                                 .PAGE   "TEST EC        BAL TEST 2"
                                         ;****************************************************************
                                         ;++
                                         ; TEST  EC       BAL TEST 2
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS IS A TEST OF THE BAL, BYTE ALIGNER, AND BYTE MASK
                                         ;       GENERATER USING DT=WORD AND VA<1:0>=11. AN ALIGNMENT
                                         ;       UTRAP SHOULD OCCUR AFTER THE FIRST REFERENCE BUT NOT AFTER
                                         ;       THE SECOND REFERENCE.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                         ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                         ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                         ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                         ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                         ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                         ;       IF THE APPROPRIATE HIT SIGNAL IS INCCRRECT FROM THAT MODULE;
                                         ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                         ;       REGISTER ON THE SBI CONTROL MODULE.
                                         ;       THE BYTE ALIGNER IS ON DBP.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       EXPECTED DATA AT LOCATION 0
                                         ;       EXPECTED DATA AT LOCATION 4
                                         ;       GOT DATA AT LOCATION 0
                                         ;       GOT DATA AT LOCATION 4
                                         ;       ADDRESS WRITTEN
                                         ;       DATA WRITTEN
                                         ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                         ;               FLAG            UTRAP TYPE
                                         ;               ----            ----------
                                         ;               1DE             NO UTRAP OCCURRED
                                         ;               DE              CACHE PARITY UTRAP
                                         ;               15E             TB PARITY ERROR
                                         ;               19E             TB MISS
                                         ;               1CE             TB PROTECTION ERROR
                                         ;               1D6             TB MODIFY BIT ERROR
                                         ;               1DA             X PAGE UTRAP
                                         ;               1DC             UNALIGNED DATA UTRAP
                                         ;
                                         ;--
                                         ;****************************************************************
                                         =0
U 103A, 0000,003D,0180,0800,0000,10B5    BAL2:   NEWTST
U 103B, 0F03,003C,0180,0AF8,0000,103C            D_0,R[0F]_0
U 103C, 0000,003D,4980,3C00,0000,111C    =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI OFF
U 103D, 0018,0038,5D80,09F8,0000,1149            RC[0F]_K[.7]
U 1149, 0018,0038,0D80,09D0,0000,103E            RC[0A]_K[.3]            ; ADDRESS BEING TESTED
U 103E, 0F00,003D,0180,0800,0000,10D2    =0      D_0,CALL,J/DC.1DE       ; GET CONSTANT USED AS UTRAP FLAG
U 103F, 0001,003C,0180,0AF0,0000,114A            R[0E]_D
U 114A, 0F18,0038,1980,0800,0200,114B            VA_K[ZERO],D_0          ; INVALIDATE LOCATION 0 IN
U 114B, 0000,003C,0180,9000,0000,114C            FS7MCT,MCT/INVALIDATE   ; BOTH GROUPS
U 114C, 0000,003C,0180,0803,0000,114D            VA_VA+4                 ; INVALIDATE LOCATION 4
```

```
U 114D, 0000,003C,0180,9000,0000,114E    ;2222            FS/MCT,MCT/INVALIDATE    ; IN BOTH GROUPS
U 114E, 0018,0038,6180,0AA0,0000,1040    ;2223            R[4]_K[.F]               ; TEST PATTERN COUNTER
U 1040, 0000,003D,0180,0800,0000,10C8    ;2224    =0      ERLOOP
U 1041, 0000,003C,0180,0A20,0082,114F    ;2225    BAL2A:  SC_R[4]                  ; GENERATE TEST DATA PATTERN
U 114F, 0818,0038,C180,0800,0000,1150    ;2226            D_R[.FFFF]               ; AND EXPECTED RESULTS
U 1150, 0801,0034,71F8,0800,0084,7151    ;2227            A[U_D.AND.MASK,D_ALU,Q_0,SC_K[.FFF8]
U 1151, 0D00,003C,0180,0A20,0082,1152    ;2228            D_DAL.SC,SC_R[4]
U 1152, 0001,003C,0180,09E8,0000,1153    ;2229            RC[0D]_D
U 1153, 0F00,0038,71C0,09C8,0084,7154    ;2230            ALU_MASK,Q_ALU,RC[9]_ALU,D_0,SC_K[.FFF8]
U 1154, 0D00,003C,0180,0800,0000,1156    ;2231            D_DAL.SC
U 1156, 0001,003C,0180,09F0,0000,1042    ;2232            RC[0E]_D
U 1042, 0000,003D,0180,0800,0000,1120    ;2233    =0      CALL,J7ROS               ; SET FORCE REPLACE GROUP 0 BIT
U 1043, 0F18,0038,1980,0800,0200,1157    ;2234            VA_K[ZERO],D_0           ; WRITE DATA=00000000 INTO LOCATION
U 1157, 0000,003C,0180,9800,0000,1158    ;2235            FS7MCT,MCT/VALIDATE      ; 0 OF GROUP 0
U 1158, 0F18,0038,1180,0800,0200,1159    ;2236            VA_K[.4],D_0             ; WRITE DATA=00000000 INTO LOCATION 4
U 1159, 0000,003C,0180,9800,0000,1044    ;2237            FS7MCT,MCT7VALIDATE      ; OF GROUP 0
U 1044, 0000,003D,0180,0800,0000,111C    ;2238    =0      CALL,J/SOFF              ; CLEAR FORCE REPLACE BITS
U 1045, 0018,0038,0D80,0800,0200,115A    ;2239            VA_K[.3]                 ; PUT TEST ADDRESS INTO VA
U 115A, 0810,0038,0180,0948,0000,115B    ;2240            D_RC[9]                  ; LOAD TEST CATA PATTERN INTO D
U 115B, 0000,003C,0180,0A70,0000,115C    ;2241            LAB_R[0E]
U 115C, 0000,003C,0180,0AF8,0000,115D    ;2242            R[0F]_LA                 ; LOAD UTRAP FLAG
U 115D, 0000,403C,0180,3000,0000,115E    ;2243            FS/MCT,MCT/WRITE.V.WCHK,DT/WORD ; TEST INSTRUCTION, FIRST REF. SHOULD UTRAP
U 115E, 0800,003C,0180,0A78,0000,115F    ;2244            D_R[0F]                  ; SEE IF UTRAP OCCURRED
U 115F, 0003,003C,0180,0AF8,0000,1160    ;2245            R[0F]_0
U 1160, 0000,003C,01C0,0A70,0000,1161    ;2246            Q_R[0E]
U 1161, 001D,2000,0180,0800,0010,1162    ;2247            A[U_Q-D,CLK.UBCC
U 1162, 0000,013C,0180,0800,0000,1046    ;2248            Z?
U 1046, 0000,003C,0180,0800,0000,1163    ;2249    =0      J/BAL2B
U 1047, 0001,003D,0180,09C0,0000,10C9    ;2250            ERROR1,RC[8]_D           ; NO UTRAP OCCURRED
U 1163, 0019,0034,0980,0800,0010,1164    ;2251    BAL2B:  ALU_D[AND]K[.2],CLK.UBCC ; SEE IF UTRAP WAS BECAUSE OF
U 1164, 0000,013C,0180,0800,0000,1048    ;2252            Z?                       ; UNALIGNED DATA
U 1048, 0001,003D,0180,09C0,0000,10C9    ;2253    =0      ERROR1,RC[8]_D           ; UTRAP NOT BECAUSE ALIGN
U 1049, 0000,003C,0180,0803,0000,1165    ;2254            VA_VA+4                  ; LOAD 4 INTO VA FOR SECOND REF.
U 1165, 0810,0038,0180,0948,0000,1166    ;2255            D_RC[9]                  ; PLACE TEST DATA INTO D
U 1166, 0000,003C,0180,0A70,0000,1167    ;2256            LAB_R[0E]
U 1167, 0000,003C,0180,0AF8,0000,1168    ;2257            R[0F]_LA                 ; SET UP UTRAP FLAG
U 1168, 0000,003C,0180,3000,3000,1169    ;2258            FS/MCT,MCT/WRITE.V.WCHK,MSC/SECOND.REF,DT/LONG  ; NOTE SAVED CONTEX SHOULD B
U 1169, 0800,003C,0180,0A78,0000,116A    ;2259            D_R[0F]                  ; SEE IF A UTRAP OCCURRED
U 116A, 0003,003C,0180,0AF8,0000,116B    ;2260            R[0F]_0
U 116B, 0000,003C,01C0,0A70,0000,116C    ;2261            Q_R[0E]
U 116C, 001D,2000,0180,0800,0010,116D    ;2262            A[U_Q-D,CLK.UBCC
U 116D, 0000,013C,0180,0800,0000,104A    ;2263            Z?
U 104A, 0001,003D,0180,09C0,0000,10C9    ;2264    =0      ERROR1,RC[8]_D           ; UTRAPPED
U 104B, 0018,0038,1980,0800,0200,116E    ;2265            VA_K[ZERO]               : READ BACK THE FIRST HALF OF THE RESULT
U 116E, 0000,003C,0180,0A70,0000,116F    ;2266            LAB_R[0E]
U 116F, 0000,003C,0180,0AF8,0000,1170    ;2267            R[0F]_LA                 ; SET UP UTRAP FLAG
U 1170, 0000,003C,0180,5000,0000,1171    ;2268            FS/MCT,MCT/READ.V.WCHK   ; READ LOCATION 0 IN GROUP 0
U 1171, 0001,003C,0180,09E0,0000,1172    ;2269            RC[0C]_D                 ; SAVE THE RESULT
U 1172, 0800,003C,0180,0A78,0000,1173    ;2270            D_R[0F]                  ; SEE IF A UTRAP OCCURRED
U 1173, 0003,003C,0180,0AF8,0000,1174    ;2271            R[0F]_0
U 1174, 0000,003C,01C0,0A70,0000,1175    ;2272            Q_R[0E]
U 1175, 001D,2000,0180,0800,0010,1176    ;2273            A[U_Q-D,CLK.UBCC
U 1176, 0000,013C,0180,0800,0000,104C    ;2274            Z?
U 104C, 0001,003D,0180,09C0,0000,10C9    ;2275    =0      ERROR1,RC[8]_D           ; UTRAPPED
U 104D, 0018,0038,1180,0800,0200,1177    ;2276            VA_K[.4]                 ; READ THE SECOND HALF OF THE RESULT
```

```
U 1177, 0000,003C,0180,0A70,0000,1178   ;2277          LAB_R[0E]
U 1178, 0000,003C,0180,0AF8,0000,1179   ;2278          R[0F]_LA                 ; SET UP THE UTRAP FLAG
U 1179, 0000,003C,0180,5000,0000,117A   ;2279          FS/MCT,MCT/READ.V.WCHK   ; READ LOCATION 4 OF GROUP 0
U 117A, 0001,003C,0180,09D8,0000,117B   ;2280          RC[0B]_D                 ; SAVE THE RESULT
U 117B, 0800,003C,0180,0A78,0000,1180   ;2281          D_R[0F]                  ; SEE IF A UTRAP OCCURRED
U 1180, 0003,003C,0180,0AF8,0000,1181   ;2282          R[0F]_0
U 1181, 0000,003C,01C0,0A70,0000,1182   ;2283          Q_R[0E]
U 1182, 001D,2000,0180,0800,0010,1183   ;2284          ALU_Q-D,CLK.UBCC
U 1183, 0000,013C,0180,0800,0000,1050   ;2285          Z?
U 1050, 0001,003D,0180,09C0,0000,10C9   ;2286    =0    ERROR1,RC[8]_D           ; UTRAPPED
U 1051, 0010,0038,01C0,0970,0000,1184   ;2287          Q_RC[0E]                 ; CHECK THE CONTENTS OF LOCATION 0
U 1184, 0810,0038,0180,0960,0000,1185   ;2288          D_RC[0C]
U 1185, 001D,2000,0180,0800,0010,1186   ;2289          ALU_Q-D,CLK.UBCC
U 1186, 0000,013C,0180,0800,0000,1052   ;2290          Z?
U 1052, 0000,003D,0180,0800,0000,10C9   ;2291    =0    ERROR1                   ; DATA AT LOCATION 0 INCORRECT
U 1053, 0010,0038,01C0,0968,0000,1187   ;2292          Q_RC[0D]                 ; CHECK THE CONTENTS OF LOCATION 4
U 1187, 0810,0038,0180,0958,0000,1188   ;2293          D_RC[0B]
U 1188, 001D,2000,0180,0800,0010,1189   ;2294          ALU_Q-D,CLK.UBCC
U 1189, 0000,013C,0180,0800,0000,1054   ;2295          Z?
U 1054, 0000,003D,0180,0800,0000,10C9   ;2296    =0    ERROR1                   ; DATA AT LOCATION 4 INCORRECT.
U 1055, 0000,003C,0180,0A20,0010,118A   ;2297          ALU_R[4],CLK.UBCC        ; HAVE ALL DATA PATTERNS BEEN TRIED?
U 118A, 0000,013C,0180,0800,0000,1056   ;2298          Z?
U 1056, 0018,0000,0580,0AA0,0000,1041   ;2299    =0    R[4]_LA-K[.1],J/BAL2A    ; IF NOT CONTINUE
U 1057, 0000,003C,0180,0800,0000,1058   ;2300          NOP
```

```
                                                .PAGE   "TEST ED        BAL TEST 3"
                                        ;*******************************************************************
                                        ;++
                                        ; TEST  ED      BAL TEST 3
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF THE BAL, BYTE ALIGNER, AND THE BYTE
                                        ;       MASK GENERATER USING DATA TYPE=WORD AND VA,01:00>= 10, 01 AND 00.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                        ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                        ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                        ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                        ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                        ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                        ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                        ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                        ;       REGISTER ON THE SBI CONTROL MODULE.
                                        ;       THE BYTE ALIGNER IS ON DBP.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED DATA AT LOCATION 0
                                        ;       EXPECTED DATA AT LOCATION 4
                                        ;       GOT DATA AT LOCATION 0
                                        ;       GOT DATA AT LOCATION 4
                                        ;       ADDRESS WRITTEN
                                        ;       DATA WRITTEN
                                        ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                        ;               FLAG            UTRAP TYPE
                                        ;               ----            ----------
                                        ;               1DE             NO UTRAP OCCURRED
                                        ;               DE              CACHE PARITY UTRAP
                                        ;               15E             TB PARITY ERROR
                                        ;               19E             TB MISS
                                        ;               1CE             TB PROTECTION ERROR
                                        ;               1D6             TB MODIFY BIT ERROR
                                        ;               1DA             X PAGE UTRAP
                                        ;               1DC             UNALIGNED DATA UTRAP
                                        ;
                                        ;--
                                        ;*******************************************************************
                                        =0
U 1058, 0000,003D,0180,0800,0000,10B5   BAL3:   NEWTST
U 1059, 0F03,003C,0180,0AF8,0000,105C           D_0,R[0F]_D
U 105C, 0000,003D,4980,3C00,0000,111C   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 105D, 0018,0038,5D80,09F8,0000,118B           RC[0F]_K[.7]
U 118B, 0018,0038,0980,0AB8,0000,1060           R[7]_K[.2]              ; ADDRESS USED INTEST
U 1060, 0F00,003D,0180,0800,0000,10D2   =0      D_0,CALL,J/DC.1DE       ; GET CONSTANT USED AS UTRAP FLAG
U 1061, 0001,003C,0180,0AF0,0000,118C           R[0E]_D
U 118C, 0F18,0038,1980,0800,0200,118D           VA_K[ZERO],D_0          ; INVALIDATE LOCATION 0
U 118D, 0000,003C,0180,9000,0000,118E           FS7MCT,MCT/INVALIDATE   ; OF BOTH GROUPS
U 118E, 0000,003C,0180,0803,0000,118F           VA_VA+4                 ; INVALIDATE LOCATION 4
U 118F, 0000,003C,0180,9000,0000,1190           FS7MCT,MCT/INVALIDATE   ; IN BOTH GROUPS
U 1190, 0800,003C,0180,0A38,0000,1191   BAL3A:  D_R[7]                  ; INITIALIZE THE FLOATING PATTERN
```

```
U 1191, 0001,003C,0180,09D0,0000,1192   ;2356           RC[0A]_D                   ; USED AS TEST DATA.
U 1192, 0100,003C,0180,0800,0000,1193   ;2357           D_D.LEFT2,SI/ZERO
U 1193, 0500,003C,0180,0800,0000,1194   ;2358           D_D.LEFT,SI/ZERO
U 1194, 0001,003C,0180,0A98,0000,1195   ;2359           R[3]_D
U 1195, 0018,0038,6180,0AA0,0000,1062   ;2360           R[4]_K[.F]                 ; TEST PATTERN COUNTER
U 1062, 0000,003D,0180,0800,0000,10C8   ;2361   =0      ERLOOP
U 1063, 0000,003C,0180,0A20,0082,1196   ;2362   BAL3B:  SC_R[4]                    ; GENERATE THE TEST DATA
U 1196, 0800,0038,0180,09C8,0000,1197   ;2363           ALU_MASK,RC[9]_ALU,D_ALU   ; PATTERN AND THE EXPECTED RESULT
U 1197, 0819,0034,C180,0800,0000,1198   ;2364           ALU_D[AND]K[.FFFF],D_ALU
U 1198, 0000,003C,01F8,0A18,0082,1199   ;2365           SC_R[3],Q_0
U 1199, 0D00,003C,0180,0800,0000,119A   ;2366           D_DAL.SC
U 119A, 0001,003C,0180,09F0,0000,119B   ;2367           RC[0E]_D
U 119B, 0003,003C,0180,09E8,0000,1064   ;2368           RC[0D]_0
U 1064, 0000,003D,0180,0800,0000,1120   ;2369   =0      CALL,J/ZROS                ; SET THE FORCE REPLACE GROUP 0 BIT
U 1065, 0F18,0038,1980,0800,0200,119C   ;2370           VA_K[ZERO],D_0             ; WRITE DATA=0 INTO LOCATION 0
U 119C, 0000,003C,0180,9800,0000,119D   ;2371           FS/MCT,MCT/VALIDATE        ; OF GROUP 0
U 119D, 0F00,003C,0180,0803,0000,119E   ;2372           VA_VA+4,D_0                ; WRITE DATA=0 INTO LOCATION 4
U 119E, 0000,003C,0180,9800,0000,1066   ;2373           FS/MCT,MCT/VALIDATE        ; OF GROUP 0
U 1066, 0000,003D,0180,0800,0000,111C   ;2374   =0      CALL,J/SOFF                ; CLEAR THE FORCE REPLACE BITS
U 1067, 0000,003C,0180,0A38,0200,119F   ;2375           VA_R[7]                    ; LOAD THE TEST ADDRESS INTO THE VA
U 119F, 0810,0038,0180,0948,0000,11A0   ;2376           D_RC[9]                    ; PUT THE TEST DATA INTO D
U 11A0, 0000,003C,0180,0A70,0000,11A1   ;2377           LAB_R[0E]
U 11A1, 0000,003C,0180,0AF8,0000,11A2   ;2378           R[0F]_LA                   ; SET UP THE UTRAP FLAG
U 11A2, 0000,403C,0180,3000,0000,11A3   ;2379           FS/MCT,MCT/WRITE.V.WCHK,DT/WORD ; TEST INSTRUCTION, SHOULD NOT UTRAP
U 11A3, 0800,003C,0180,0A78,0000,11A4   ;2380           D_R[0F]                    ; SEE IF A UTRAP OCCURRED
U 11A4, 0003,003C,0180,0AF8,0000,11A5   ;2381           R[0F]_0
U 11A5, 0000,003C,01C0,0A70,0000,11A6   ;2382           Q_R[0E]
U 11A6, 001D,2000,0180,0800,0010,11A7   ;2383           ALU_Q-D,CLK.UBCC
U 11A7, 0000,013C,0180,0800,0000,1068   ;2384           Z?
U 1068, 0001,003D,0180,09C0,0000,10C9   ;2385   =0      ERROR1,RC[8]_D             ; REFERENCE CAUSED UTRAP
U 1069, 0018,0038,1980,0800,0200,11A8   ;2386           VA_K[ZERO]                 ; GET FIRST HALF OF THE RESULT
U 11A8, 0000,003C,0180,0A70,0000,11A9   ;2387           LAB_R[0E]
U 11A9, 0000,003C,0180,0AF8,0000,11AA   ;2388           R[0F]_LA                   ; SET UP UTRAP FLAG
U 11AA, 0000,003C,0180,5000,0000,11AB   ;2389           FS/MCT,MCT/READ.V.WCHK     ; READ LOCATION 0 FROM GROUP 0
U 11AB, 0001,003C,0180,09E0,0000,11AC   ;2390           RC[0C]_D                   ; SAVE THE RESULT
U 11AC, 0800,003C,0180,0A78,0000,11AD   ;2391           D_R[0F]                    ; SEE IF A UTRAP OCCURRED
U 11AD, 0003,003C,0180,0AF8,0000,11AE   ;2392           R[0F]_0
U 11AE, 0000,003C,01C0,0A70,0000,11AF   ;2393           Q_R[0E]
U 11AF, 001D,2000,0180,0800,0010,11B0   ;2394           ALU_Q-D,CLK.UBCC
U 11B0, 0000,013C,0180,0800,0000,106A   ;2395           Z?
U 106A, 0001,003D,0180,09C0,0000,10C9   ;2396   =0      ERROR1,RC[8]_D             ; A UTRAP OCCURRED ON THE REFERENCE
U 106B, 0000,003C,0180,0803,0000,11B1   ;2397           VA_VA+4                    ; GET THE SECOND HALF OF THE RESULT
U 11B1, 0000,003C,0180,0A70,0000,11B2   ;2398           LAB_R[0E]
U 11B2, 0000,003C,0180,0AF8,0000,11B3   ;2399           R[0F]_LA                   ; SET UP THE UTRAP FLAG
U 11B3, 0000,003C,0180,5000,0000,11B4   ;2400           FS/MCT,MCT/READ.V.WCHK     ; READ LOCATION 4 FROM GROUP 0
U 11B4, 0001,003C,0180,09D8,0000,11B5   ;2401           RC[0B]_D                   ; SAVE THE RESULT
U 11B5, 0800,003C,0180,0A78,0000,11B6   ;2402           D_R[0F]                    ; SEE IF A UTRAP OCCURRED
U 11B6, 0003,003C,0180,0AF8,0000,11B7   ;2403           R[0F]_0
U 11B7, 0000,003C,01C0,0A70,0000,11B8   ;2404           Q_R[0E]
U 11B8, 001D,2000,0180,0800,0010,11B9   ;2405           ALU_Q-D,CLK.UBCC
U 11B9, 0000,013C,0180,0800,0000,106C   ;2406           Z?
U 106C, 0001,003D,0180,09C0,0000,10C9   ;2407   =0      ERROR1,RC[8]_D             ; A UTRAP OCCURRED ON THE REFERENCE
U 106D, 0010,0038,01C0,0970,0000,11BA   ;2408           Q_RC[0E]                   ; CHECK THE DATA AT LOCATION 0
U 11BA, 0810,0038,0180,0960,0000,11BB   ;2409           D_RC[0C]
U 11BB, 001D,2000,0180,0800,0010,11BC   ;2410           ALU_Q-D,CLK.UBCC
```

```
U 11BC, 0000,013C,0180,0800,0000,106E   ;2411           Z?
U 106E, 0000,003D,0180,0800,0000,10C9   ;2412   =0      ERROR1                  ; DATA AT LOCATION 0 INCORRECT
U 106F, 0010,0038,0180,0968,0010,11BD   ;2413           ALU_RC[0D],CLK.UBCC     ; CHECK THE DATA AT LOCATION 4
U 11BD, 0000,013C,0180,0800,0000,1070   ;2414           Z?
U 1070, 0000,003D,0180,0800,0000,10C9   ;2415   =0      ERROR1                  ; DATA AT LOCATION 4 INCORRECT
U 1071, 0000,003C,0180,0A20,0010,11BE   ;2416           ALU_R[4],CLK.UBCC       ; TRIED ALL DATA PATTERNS?
U 11BE, 0000,013C,0180,0800,0000,1072   ;2417           Z?
U 1072, 0018,0000,0580,0AA0,0000,1063   ;2418   =0      R[4]_LA-K[.1],J/BAL3B   ; IF NOT CONTINUE
U 1073, 0000,003C,0180,0A38,0010,11BF   ;2419           ALU_R[7],CLK.UBCC       ; HAS EACH ADDRESS 2, 1 AND 0 BEEN TESTED?
U 11BF, 0000,013C,0180,0800,0000,1074   ;2420           Z?
U 1074, 0018,0000,0580,0AB8,0000,1190   ;2421   =0      R[7]_LA-K[.1],J/BAL3A   ; IF NOT CONTINUE
U 1075, 0000,003C,0180,0800,0000,1076   ;2422           NOP
```

```
                                      ;2423           .PAGE   "TEST EE        BAL TEST 4"
                                      ;2424   ;******************************************************************
                                      ;2425   ;++
                                      ;2426   ; TEST  EE       BAL TEST 4
                                      ;2427   ;
                                      ;2428   ; TEST DESCRIPTION
                                      ;2429   ;       THIS IS A TEST OF THE BAL, BYTE ALIGNER, AND THE BYTE MASK
                                      ;2430   ;       GENERATER USING DT=BYTE AND VA<1:0>= 11, 10, 01 AND 00.
                                      ;2431   ;       THIS TEST USES GROUP 0 IN THE CACHE.
                                      ;2432   ;
                                      ;2433   ; LOGIC DESCRIPTION
                                      ;2434   ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                      ;2435   ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                      ;2436   ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                      ;2437   ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                      ;2438   ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                      ;2439   ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                      ;2440   ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                      ;2441   ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                      ;2442   ;       REGISTER ON THE SBI CONTROL MODULE.
                                      ;2443   ;       THE BYTE ALIGNER IS ON DBP.
                                      ;2444   ;
                                      ;2445   ; ERROR DESCRIPTION
                                      ;2446   ;       EXPECTED DATA AT LOCATION 0
                                      ;2447   ;       EXPECTED DATA AT LOCATION 4
                                      ;2448   ;       GOT DATA AT LOCATION 0
                                      ;2449   ;       GOT DATA AT LOCATION 4
                                      ;2450   ;       ADDRESS WRITTEN
                                      ;2451   ;       DATA WRITTEN
                                      ;2452   ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                      ;2453   ;               FLAG                UTRAP TYPE
                                      ;2454   ;               ----                ----------
                                      ;2455   ;               1DE                 NO UTRAP OCCURRED
                                      ;2456   ;               DE                  CACHE PARITY UTRAP
                                      ;2457   ;               15E                 TB PARITY ERROR
                                      ;2458   ;               19E                 TB MISS
                                      ;2459   ;               1CE                 TB PROTECTION ERROR
                                      ;2460   ;               1D6                 TB MODIFY BIT ERROR
                                      ;2461   ;               1DA                 X PAGE UTRAP
                                      ;2462   ;               1DC                 UNALIGNED DATA UTRAP
                                      ;2463   ;
                                      ;2464   ;--
                                      ;2465   ;******************************************************************
                                      ;2466   =0
U 1076, 0000,003D,0180,0800,0000,10B5 ;2467   BAL4:   NEWTST
U 1077, 0F00,003C,0180,0800,0000,1078 ;2468           D_0
U 1078, 0000,003D,4980,3C00,0000,111C ;2469   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 1079, 0018,0038,5D80,09F8,0000,11C0 ;2470           RC[0F]_K[.7]
U 11C0, 0018,0038,0D80,0AB8,0000,107A ;2471           R[7]_K[.3]              ; ADDRESS USED IN THIS TEST
U 107A, 0F00,003D,0180,0800,0000,10D2 ;2472   =0      D_0,CALL,J/DC.1DE       ; GET THE CONSTANT USED AS UTRAP FLAG
U 107B, 0001,003C,0180,0AF0,0000,11C1 ;2473           R[0E]_D
U 11C1, 0F18,0038,1980,0AF8,0200,11C2 ;2474           VA_K[ZERO],R[0F]_K[ZERO],D_0 ; INVALIDATE LOCATION 0
U 11C2, 0000,003C,0180,9000,0000,11C3 ;2475           FS7MCT,MCT/INVALIDATE   ; OF BOTH GROUPS
U 11C3, 0F00,003C,0180,0803,0000,11C4 ;2476           VA_VA+4,D_0             ; INVALIDATE LOCATION 4
U 11C4, 0000,003C,0180,9000,0000,11C5 ;2477           FS7MCT,MCT/INVALIDATE   ; OF BOTH GROUPS
```

```
U 11C5, 0800,003C,0180,0A38,0000,11C6    ;2478    BAL4A:  D_R[7]                    ; INITIALIZE THE TEST
U 11C6, 0001,003C,0180,09D0,0000,11C7    ;2479            RC[0A]_D                  ; DATA PATTERN
U 11C7, 0500,003C,0180,0800,0000,11C8    ;2480            D_D.LEFT,SI/ZERO
U 11C8, 0100,003C,0180,0800,0000,11C9    ;2481            D_D.LEFT2,SI/ZERO
U 11C9, 0001,003C,0180,0A98,0000,11CA    ;2482            R[3]_D
U 11CA, 0018,0038,5D80,0AA0,0000,107C    ;2483            R[4]_K[.7]                ; COUNTER FOR TEST PATTERNS
U 107C, 0000,003D,0180,0800,0000,10C8    ;2484    =0      ERLOOP
U 107D, 0000,003C,0180,0A20,0082,11CB    ;2485    BAL4B:  SC_R[4]                   ; GENERATE THE TEST DATA AND
U 11CB, 0800,0038,0180,09C8,0000,11CC    ;2486            ALU_MASK,RC[9]_ALU,D_ALU  ; EXPECTED RESULTS
U 11CC, 0819,0034,4980,0800,0000,11CD    ;2487            ALU_D[AND]K[.FF],D_ALU
U 11CD, 0000,003C,01F8,0A18,0082,11CE    ;2488            SC_R[3],Q_0
U 11CE, 0D00,003C,0180,0800,0000,11CF    ;2489            D_DAL.SC
U 11CF, 0001,003C,0180,09F0,0000,11D0    ;2490            RC[0E]_D
U 11D0, 0003,003C,0180,09E8,0000,107E    ;2491            RC[0D]_0
U 107E, 0000,003D,0180,0800,0000,1120    ;2492    =0      CALL,J/ZROS               ; SET THE FORCE REPLACE GROUP 0 BIT
U 107F, 0F18,0038,1980,0800,0200,11D1    ;2493            VA_K[ZERO],D_0            ; WRITE DATA=00000000 INTO LOCATION 0
U 11D1, 0000,003C,0180,9800,0000,11D2    ;2494            FS/MCT,MCT/VALIDATE       ; OF GROUP 0
U 11D2, 0F00,003C,0180,0803,0000,11D3    ;2495            VA_VA+4,D_0               ; WRITE DATA=00000000 INTO LOCATION 4
U 11D3, 0000,003C,0180,9800,0000,1080    ;2496            FS/MCT,MCT/VALIDATE       ; OF GROUP 0
U 1080, 0000,003D,0180,0800,0000,111C    ;2497    =0      CALL,J/SOFF               ; CLEAR THE FORCE REPLACE BITS
U 1081, 0000,003C,0180,0A38,0200,11D4    ;2498            VA_R[7]                   ; PUT THE TEST ADDRESS INTO THE VA
U 11D4, 0810,0038,0180,0948,0000,11D5    ;2499            D_RC[9]                   ; PUT THE TEST DATA INTO THE D REG
U 11D5, 0000,003C,0180,0A70,0000,11D6    ;2500            LAB_R[0E]
U 11D6, 0000,003C,0180,0AF8,0000,11D7    ;2501            R[0F]_LA                  ; SET UP THE UTRAP FLAG
U 11D7, 0000,803C,0180,3000,0000,11D8    ;2502            FS/MCT,MCT/WRITE.V.WCHK,DT/BYTE ; TEST INSTRUCTION, SHOULD NOT UTRAP
U 11D8, 0800,003C,0180,0A78,0000,11D9    ;2503            D_R[0F]                   ; SEE IF A UTRAP OCCURRED
U 11D9, 0003,003C,0180,0AF8,0000,11DA    ;2504            R[0F]_0
U 11DA, 0000,003C,01C0,0A70,0000,11DB    ;2505            Q_R[0E]
U 11DB, 001D,2000,0180,0800,0010,11DC    ;2506            ALU_Q-D,CLK.UBCC
U 11DC, 0000,013C,0180,0800,0000,1082    ;2507            Z?
U 1082, 0001,003D,0180,09C0,0000,10C9    ;2508    =0      ERROR1,RC[8]_D            ; A UTRAP OCCURRED ON THE REFERENCE WITH DT=BYTE
U 1083, 0018,0038,1980,0800,0200,11DD    ;2509            VA_K[ZERO]                ; READ BACK THE FIRST HALF OF THE RESULT
U 11DD, 0000,003C,0180,0A70,0000,11DE    ;2510            LAB_R[0E]
U 11DE, 0000,003C,0180,0AF8,0000,11DF    ;2511            R[0F]_LA                  ; SET UP THE UTRAP FLAG
U 11DF, 0000,003C,0180,5000,0000,11E0    ;2512            FS/MCT,MCT/READ.V.WCHK    ; READ LOCATION 0 OF GROUP 0
U 11E0, 0001,003C,0180,09E0,0000,11E1    ;2513            RC[0C]_D                  ; SAVE THE DATA
U 11E1, 0800,003C,0180,0A78,0000,11E2    ;2514            D_R[0F]                   ; SEE IF A UTRAP OCCURRED
U 11E2, 0003,003C,0180,0AF8,0000,11E3    ;2515            R[0F]_0
U 11E3, 0000,003C,01C0,0A70,0000,11E4    ;2516            Q_R[0E]
U 11E4, 001D,2000,0180,0800,0010,11E5    ;2517            ALU_Q-D,CLK.UBCC
U 11E5, 0000,013C,0180,0800,0000,1084    ;2518            Z?
U 1084, 0001,003D,0180,09C0,0000,10C9    ;2519    =0      ERROR1,RC[8]_D            ; A UTRAP OCCURRED ON THE REFERENCE
U 1085, 0000,003C,0180,0803,0000,11E6    ;2520            VA_VA+4                   ; READ BACK THE SECOND HALF OF THE RESULT
U 11E6, 0000,003C,0180,0A70,0000,11E7    ;2521            LAB_R[0E]
U 11E7, 0000,003C,0180,0AF8,0000,11E8    ;2522            R[0F]_LA                  ; SET UP THE UTRAP FLAG
U 11E8, 0000,003C,0180,5000,0000,11E9    ;2523            FS/MCT,MCT/READ.V.WCHK    ; READ LOCATION 4 FROM GROUP 0
U 11E9, 0001,003C,0180,09D8,0000,11EA    ;2524            RC[0B]_D                  ; SAVE THE RESULT
U 11EA, 0800,003C,0180,0A78,0000,11EB    ;2525            D_R[0F]                   ; SEE IF A UTRAP OCCURRED
U 11EB, 0003,003C,0180,0AF8,0000,11EC    ;2526            R[0F]_0
U 11EC, 0000,003C,01C0,0A70,0000,11ED    ;2527            Q_R[0E]
U 11ED, 001D,2000,0180,0800,0010,11EE    ;2528            ALU_Q-D,CLK.UBCC
U 11EE, 0000,013C,0180,0800,0000,1086    ;2529            Z?
U 1086, 0001,003D,0180,09C0,0000,10C9    ;2530    =0      ERROR1,RC[8]_D            ; A UTRAP OCCURRED ON THE REFERENEC
U 1087, 0010,0038,01C0,0970,0000,11EF    ;2531            Q_RC[0E]                  ; CHECK THE DATA AT LOCATION 0
U 11EF, 0810,0038,0180,0960,0000,11F0    ;2532            D_RC[0C]
```

```
U 11F0, 001D,2000,0180,0800,0010,11F1    ;2533          ALU_Q-D,CLK.UBCC
U 11F1, 0000,013C,0180,0800,0000,1088    ;2534          Z?
U 1088, 0000,003D,0180,0800,0000,10C9    ;2535   =0     ERROR1                  ; DATA AT LOCATION 0 INCORRECT
U 1089, 0010,0038,01C0,0968,0000,11F2    ;2536          Q_RC[0D]                ; CHECK THE DATA AT LOCATION 4
U 11F2, 0810,0038,0180,0958,0000,11F3    ;2537          D_RC[0B]
U 11F3, 001D,2000,0180,0800,0010,11F4    ;2538          ALU_Q-D,CLK.UBCC
U 11F4, 0000,013C,0180,0800,0000,108A    ;2539          Z?
U 108A, 0000,003D,0180,0800,0000,10C9    ;2540   =0     ERROR1                  ; DATA AT LOCTION 4 INCORRECT
U 108B, 0000,003C,0180,0A20,0010,11F5    ;2541          ALU_R[4],CLK.UBCC       ; HAVE ALL TEST PATTERNS BEEN TRIED?
U 11F5, 0000,013C,0180,0800,0000,108C    ;2542          Z?
U 108C, 0018,0000,0580,0AA0,0000,107D    ;2543   =0     R[4]_LA-K[.1],J/BAL4B   ; IF NOT CONTINUE
U 108D, 0000,003C,0180,0A38,0010,11F6    ;2544          ALU_R[7],CLK.UBCC       ; HAS EACH ADDRESS 3, 2, 1 AND 0 BEEN TESTED?
U 11F6, 0000,013C,0180,0800,0000,108E    ;2545          Z?
U 108E, 0018,0000,0580,0AB8,0000,11C5    ;2546   =0     R[7]_LA-K[.1],J/BAL4A   ; IF NOT CONTINUE WITH NEXT
U 108F, 0000,003C,0180,0800,0000,1090    ;2547          NOP
```

```
                                                 .PAGE   "TEST EF        BAL TEST 5"
                                         ;******************************************************************
                                         ;++
                                         ; TEST  EF      BAL TEST 5
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS IS A TEST OF THE BAL, BYTE ALIGNER, AND THE BYTE MASK
                                         ;       GENERATER USING DT=BYTE AND VA<1:0>= 11, 10, 01 AND 00.
                                         ;       THIS TEST USES GROUP 1 IN THE CACHE.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;       TESTED HERE ARE THE MODULES CAM, CDM AND SBL. IF A CACHE
                                         ;       PARITY ERROR IS DETECTED THEN EITHER CAM OR CDM IS AT FAULT.
                                         ;       THE CACHE PARITY REGISTER WILL INDICATE WHICH OF THESE
                                         ;       TWO MODULES CAUSED THE PARITY ERROR. SBL GENERATES THE
                                         ;       CONTROL SIGNALS WHICH RESULT IN CACHE WRITE PULSES. IF A MISS
                                         ;       IS DETECTED AT AN ADDRESS WHICH SHOULD BE A HIT, CAM IS AT FAULT
                                         ;       IF THE APPROPRIATE HIT SIGNAL IS INCORRECT FROM THAT MODULE;
                                         ;       ANOTHER CAUSE FOR THIS SYMPTOM COULD BE A BROKEN SBI MAINTENANCE
                                         ;       REGISTER ON THE SBI CONTROL MODULE.
                                         ;       THE BYTE ALIGNER IS ON DBP.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       EXPECTED DATA AT LOCATION 0
                                         ;       EXPECTED DATA AT LOCATION 4
                                         ;       GOT DATA AT LOCATION 0
                                         ;       GOT DATA AT LOCATION 4
                                         ;       ADDRESS WRITTEN
                                         ;       DATA WRITTEN
                                         ;       UNEXPECTED UTRAP FLAG, IDENTIFY TRAP BY:
                                         ;               FLAG            UTRAP TYPE
                                         ;               ----            ----------
                                         ;               1DE             NO UTRAP OCCURRED
                                         ;               DE              CACHE PARITY UTRAP
                                         ;               15E             TB PARITY ERROR
                                         ;               19E             TB MISS
                                         ;               1CE             TB PROTECTION ERROR
                                         ;               1D6             TB MODIFY BIT ERROR
                                         ;               1DA             X PAGE UTRAP
                                         ;               1DC             UNALIGNED DATA UTRAP
                                         ;
                                         ;--
                                         ;******************************************************************
                                         =0
U 1090, 0000,003D,0180,0800,0000,10B5    BAL5:   NEWTST
U 1091, 0F00,003C,0180,0800,0000,1092            D_0
U 1092, 0000,003D,4980,3C00,0000,111C    =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 1093, 0018,0038,5D80,09F8,0000,11F7            RC[OF]_K[.7]
U 11F7, 0018,0038,0D80,0AB8,0000,1094            R[7]_K[.3]              ; ADDRESS USED IN THIS TEST
U 1094, 0F00,003D,0180,0800,0000,10D2    =0      D_0,CALL,J/DC.1DE       ; GET THE CONSTANT USED AS UTRAP FLAG
U 1095, 0001,003C,0180,0AF0,0000,11F8            R[OE]_D
U 11F8, 0F18,0038,1980,0AF8,0200,11F9            VA_K[ZERO],R[OF]_K[ZERO],D_0 ; INVALIDATE LOCATION 0
U 11F9, 0000,003C,0180,9000,0000,11FA            FS7MCT,MCT/INVALIDATE   ; OF BOTH GROUPS
U 11FA, 0F00,003C,0180,0803,0000,11FB            VA_VA+4,D_0             ; INVALIDATE LOCATION 4
U 11FB, 0000,003C,0180,9000,0000,1200            FS7MCT,MCT/INVALIDATE   ; OF BOTH GROUPS
```

```
U 1200, 0800,003C,0180,0A38,0000,1201    ;2603   BAL5A:  D_R[7]                      ; INITIALIZE THE TEST
U 1201, 0001,003C,0180,09D0,0000,1202    ;2604           RC[0A]_D                    ; DATA PATTERN
U 1202, 0500,003C,0180,0800,0000,1203    ;2605           D_D.LEFT,SI/ZERO
U 1203, 0100,003C,0180,0800,0000,1204    ;2606           D_D.LEFT2,SI/ZERO
U 1204, 0001,003C,0180,0A98,0000,1205    ;2607           R[3]_D
U 1205, 0018,0038,5D80,0AA0,0000,1096    ;2608           R[4]_K[.7]                  ; COUNTER FOR TEST PATTERNS
U 1096, 0000,003D,0180,0800,0000,10C8    ;2609   =0      ERLOOP
U 1097, 0000,003C,0180,0A20,0082,1206    ;2610   BAL5B:  SC_R[4]                     ; GENERATE THE TEST DATA AND
U 1206, 0800,0038,0180,09C8,0000,1207    ;2611           ALU_MASK,RC[9]_ALU,D_ALU ; EXPECTED RESULTS
U 1207, 0819,0034,4980,0800,0000,1208    ;2612           ALU_D[AND]K[.FF],D_ALU
U 1208, 0000,003C,01F8,0A18,0082,1209    ;2613           SC_R[3],Q_0
U 1209, 0D00,003C,0180,0800,0000,120A    ;2614           D_DAL.SC
U 120A, 0001,003C,0180,09F0,0000,120B    ;2615           RC[0E]_D
U 120B, 0003,003C,0180,09E8,0000,1098    ;2616           RC[0D]_0
U 1098, 0000,003D,0180,0800,0000,1124    ;2617   =0      CALL,J7R1S                  ; SET THE FORCE REPLACE GROUP 1 BIT
U 1099, 0F18,0038,1980,0800,0200,120C    ;2618           VA_K[ZERO],D_0              ; WRITE DATA=00000000 INTO LOCATION 0
U 120C, 0000,003C,0180,9800,0000,120D    ;2619           FS7MCT,MCT/VALIDATE         ; OF GROUP 1
U 120D, 0F00,003C,0180,0803,0000,120E    ;2620           VA_VA+4,D_0                 ; WRITE DATA=00000000 INTO LOCATION 4
U 120E, 0000,003C,0180,9800,0000,109A    ;2621           FS7MCT,MCT/VALIDATE         ; OF GROUP 1
U 109A, 0000,003D,0180,0800,0000,111C    ;2622   =0      CALL,J/SOFF                 ; CLEAR THE FORCE REPLACE BITS
U 109B, 0000,003C,0180,0A38,0200,120F    ;2623           VA_R[7]                     ; PUT THE TEST ADDRESS INTO THE VA
U 120F, 0810,0038,0180,0948,0000,1210    ;2624           D_RC[9]                     ; PUT THE TEST DATA INTO THE D REG
U 1210, 0000,003C,0180,0A70,0000,1211    ;2625           LAB_R[0E]
U 1211, 0000,003C,0180,0AF8,0000,1212    ;2626           R[0F]_LA                    ; SET UP THE UTRAP FLAG
U 1212, 0000,803C,0180,3000,0000,1213    ;2627           FS/MCT,MCT/WRITE.V.WCHK,DT/BYTE ; TEST INSTRUCTION, SHOULD NOT UTRAP
U 1213, 0800,003C,0180,0A78,0000,1214    ;2628           D_R[0F]                     ; SEE IF A UTRAP OCCURRED
U 1214, 0003,003C,0180,0AF8,0000,1215    ;2629           R[0F]_0
U 1215, 0000,003C,01C0,0A70,0000,1216    ;2630           Q_R[0E]
U 1216, 001D,2000,0180,0800,0010,1217    ;2631           ALU_Q-D,CLK.UBCC
U 1217, 0000,013C,0180,0800,0000,109C    ;2632           Z?
U 109C, 0001,003D,0180,09C0,0000,10C9    ;2633   =0      ERROR1,RC[8]_D              ; A UTRAP OCCURRED ON THE REFERENCE WITH DT=BYTE
U 109D, 0018,0038,1980,0800,0200,1218    ;2634           VA_K[ZERO]                  ; READ BACK THE FIRST HALF OF THE RESULT
U 1218, 0000,003C,0180,0A70,0000,1219    ;2635           LAB_R[0E]
U 1219, 0000,003C,0180,0AF8,0000,121A    ;2636           R[0F]_LA                    ; SET UP THE UTRAP FLAG
U 121A, 0000,003C,0180,5000,0000,121B    ;2637           FS/MCT,MCT/READ.V.WCHK      ; READ LOCATION 0 OF GROUP 1
U 121B, 0001,003C,0180,09E0,0000,121C    ;2638           RC[0C]_D                    ; SAVE THE DATA
U 121C, 0800,003C,0180,0A78,0000,121D    ;2639           D_R[0F]                     ; SEE IF A UTRAP OCCURRED
U 121D, 0003,003C,0180,0AF8,0000,121E    ;2640           R[0F]_0
U 121E, 0000,003C,01C0,0A70,0000,121F    ;2641           Q_R[0E]
U 121F, 001D,2000,0180,0800,0010,1220    ;2642           ALU_Q-D,CLK.UBCC
U 1220, 0000,013C,0180,0800,0000,109E    ;2643           Z?
U 109E, 0001,003D,0180,09C0,0000,10C9    ;2644   =0      ERROR1,RC[8]_D              ; A UTRAP OCCURRED ON THE REFERENCE
U 109F, 0000,003C,0180,0803,0000,1221    ;2645           VA_VA+4                     ; READ BACK THE SECOND HALF OF THE RESULT
U 1221, 0000,003C,0180,0A70,0000,1222    ;2646           LAB_R[0E]
U 1222, 0000,003C,0180,0AF8,0000,1223    ;2647           R[0F]_LA                    ; SET UP THE UTRAP FLAG
U 1223, 0000,003C,0180,5000,0000,1224    ;2648           FS/MCT,MCT/READ.V.WCHK      ; READ LOCATION 4 FROM GROUP 1
U 1224, 0001,003C,0180,09D8,0000,1225    ;2649           RC[0B]_D                    ; SAVE THE RESULT
U 1225, 0800,003C,0180,0A78,0000,1226    ;2650           D_R[0F]                     ; SEE IF A UTRAP OCCURRED
U 1226, 0003,003C,0180,0AF8,0000,1227    ;2651           R[0F]_0
U 1227, 0000,003C,01C0,0A70,0000,1228    ;2652           Q_R[0E]
U 1228, 001D,2000,0180,0800,0010,1229    ;2653           ALU_Q-D,CLK.UBCC
U 1229, 0000,013C,0180,0800,0000,10A0    ;2654           Z?
U 10A0, 0001,003D,0180,09C0,0000,10C9    ;2655   =0      ERROR1,RC[8]_D              ; A UTRAP OCCURRED ON THE REFERENEC
U 10A1, 0010,0038,01C0,0970,0000,122A    ;2656           Q_RC[0E]                    ; CHECK THE DATA AT LOCATION 0
U 122A, 0810,0038,0180,0960,0000,122B    ;2657           D_RC[0C]
```

```
U 122B, 001D,2000,0180,0800,0010,122C   ;2658           ALU_Q-D,CLK.UBCC
U 122C, 0000,013C,0180,0800,0000,10A2   ;2659           Z?
U 10A2, 0000,003D,0180,0800,0000,10C9   ;2660   =0      ERROR1                  ; DATA AT LOCATION 0 INCORRECT
U 10A3, 0010,0038,01C0,0968,0000,122D   ;2661           Q_RC[0D]                ; CHECK THE DATA AT LOCATION 4
U 122D, 0810,0038,0180,0958,0000,122E   ;2662           D_RC[0B]
U 122E, 001D,2000,0180,0800,0010,122F   ;2663           ALU_Q-D,CLK.UBCC
U 122F, 0000,013C,0180,0800,0000,10A4   ;2664           Z?
U 10A4, 0000,003D,0180,0800,0000,10C9   ;2665   =0      ERROR1                  ; DATA AT LOCTION 4 INCORRECT
U 10A5, 0000,003C,0180,0A20,0010,1230   ;2666           ALU_R[4],CLK.UBCC       ; HAVE ALL TEST PATTERNS BEEN TRIED?
U 1230, 0000,013C,0180,0800,0000,10A6   ;2667           Z?
U 10A6, 0018,0000,0580,0AA0,0000,1097   ;2668   =0      R[4]_LA-K[.1],J/BAL5B   ; IF NOT CONTINUE
U 10A7, 0000,003C,0180,0A38,0010,1231   ;2669           ALU_R[7],CLK.UBCC       ; HAS EACH ADDRESS 3, 2, 1 AND 0 BEEN TESTED?
U 1231, 0000,013C,0180,0800,0000,10A8   ;2670           Z?
U 10A8, 0018,0000,0580,0AB8,0000,1200   ;2671   =0      R[7]_LA-K[.1],J/BAL5A   ; IF NOT CONTINUE WITH NEXT
U 10A9, 0000,003C,0180,0800,0000,10AA   ;2672           NOP
                                        ;2673   =0
U 10AA, 0000,003D,0180,0800,0000,10B5   ;2674   DUMMY1: NEWTST
```

```
;                            Location / Line Number Index

;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 0000 - 0FFF Unused
U 1000          1871:   1838    1845=   1861=   1862=   1863=   1952=   1953=
U 1008          1954=   1955=   1980=   1981=   1983=   1984=   1986=   1987=
U 1010          1990=   1991=   1993=   1994=   1996=   1997=   2000=   2001=
U 1018          2004=   2005=   2022=   2023=   2025=   2026=   2035=   2036=
U 1020          2038=   2039=   2041=   2042=   2044=   2045=   2059=   2060=
U 1028          2067=   2068=   2081=   2082=   2129=   2130=   2132=   2133=
U 1030          2137=   2138=   2140=   2141=   2152=   2153=   2154=   2155=
U 1038          2156=   2157=   2212=   2213=   2214=   2215=   2217=   2218=
U 1040          2224=   2225=   2233=   2234=   2238=   2239=   2249=   2250=
U 1048          2253=   2254=   2264=   2265=   2275=   2276=   1902:   1839
U 1050          2286=   2287=   2291=   2292=   2296=   2297=   2299=   2300=
U 1058          2344=   2345=   1905:   1840    2346=   2347=   1908:   1841
U 1060          2349=   2350=   2361=   2362=   2369=   2370=   2374=   2375=
U 1068          2385=   2386=   2396=   2397=   2407=   2408=   2412=   2413=
U 1070          2415=   2416=   2418=   2419=   2421=   2422=   2467=   2468=
U 1078          2469=   2470=   2472=   2473=   2484=   2485=   2492=   2493=
U 1080          2497=   2498=   2508=   2509=   2519=   2520=   2530=   2531=
U 1088          2535=   2536=   2540=   2541=   2543=   2544=   2546=   2547=
U 1090          2592=   2593=   2594=   2595=   2597=   2598=   2609=   2610=
U 1098          2617=   2618=   2622=   2623=   2633=   2634=   2644=   2645=
U 10A0          2655=   2656=   2660=   2661=   2665=   2666=   2668=   2669=
U 10A8          2671=   2672=   2674=   1842    1843    1844    1864    1865
U 10B0          1866    1867    1868    1869    1870    1880    1881    1882
U 10B8          1883    1884    1885    1886    1887    1888    1889    1890
U 10C0          1891    1892    1893    1894    1895    1896    1897    1898
U 10C8          1899    1900    1901    1903    1904    1936    1937    1943
U 10D0          1944    1945    1950    1951    1957    1958    1959    1960
U 10D8          1961    1962    1963    1964    1965    1966    1967    1968
U 10E0          1969    1970    1971    1972    1973    1974    1975    1976
U 10E8          1977    1978    1982    1988    1992    1998    2002    2006
U 10F0          2010    2020    2024    2046    2047    2048    2049    2050
U 10F8          2051    2052    2053    2054    2055    2056    2057    2058
U 1100          1825:   1826:   1827:   1828:   1829:   1830:   1831:   1832:
U 1108          1833:   2061    2062    2063    1834:   1835:   1836:   1837:
U 1110          2064    2065    2066    2069    2070    2074    2075    2076
U 1118          2077    2078    2079    2080    2088    2089    2090    2091
U 1120          2093    2094    2095    2096    2098    2099    2101    2102
U 1128          2104    2105    2107    2108    2109    2111    2112    2113
U 1130          2115    2127    2131    2134    2135    2139    2142    2143
U 1138          2144    2145    2146    2147    2148    2149    2150    2151
U 1140          2158    2159    2160    2161    2162    2163    2164    2165
U 1148          2166    2216    2219    2220    2221    2222    2223    2226
U 1150          2227    2228    2229    2230    2231    1928:   2232    2235
U 1158          2236    2237    2240    2241    2242    2243    2244    2245
U 1160          2246    2247    2248    2251    2252    2255    2256    2257
U 1168          2258    2259    2260    2261    2262    2263    2266    2267
U 1170          2268    2269    2270    2271    2272    2273    2274    2277
U 1178          2278    2279    2280    2281    2011:   2012:   2013:   2014:
U 1180          2282    2283    2284    2285    2288    2289    2290    2293
U 1188          2294    2295    2298    2348    2351    2352    2353    2354
U 1190          2355    2356    2357    2358    2359    2360    2363    2364
U 1198          2365    2366    2367    2368    2371    2372    2373    2376
```

```
;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 11A0           2377     2378     2379     2380     2381     2382     2383     2384
U 11A8           2387     2388     2389     2390     2391     2392     2393     2394
U 11B0           2395     2398     2399     2400     2401     2402     2403     2404
U 11B8           2405     2406     2409     2410     2411     2414     2417     2420
U 11C0           2471     2474     2475     2476     2477     2478     2479     2480
U 11C8           2481     2482     2483     2486     2487     2488     2489     2490
U 11D0           2491     2494     2495     2496     2499     2500     2501     2502
U 11D8           2503     2504     2505     2506     2507     2510     2511     2512
U 11E0           2513     2514     2515     2516     2517     2518     2521     2522
U 11E8           2523     2524     2525     2526     2527     2528     2529     2532
U 11F0           2533     2534     2537     2538     2539     2542     2545     2596
U 11F8           2599     2600     2601     2602     2015:    2016:    2017:    2018:
U 1200           2603     2604     2605     2606     2607     2608     2611     2612
U 1208           2613     2614     2615     2616     2619     2620     2621     2624
U 1210           2625     2626     2627     2628     2629     2630     2631     2632
U 1218           2635     2636     2637     2638     2639     2640     2641     2642
U 1220           2643     2646     2647     2648     2649     2650     2651     2652
U 1228           2653     2654     2657     2658     2659     2662     2663     2664
U 1230           2667     2670
U 1238 - 12A7 Unused
U 12A8                             1929:
U 12B0 - 13EF Unused
U 13F0           1912:    1913:    1914:    1915:    1916:    1917:    1918:    1919:
U 13F8           1920:    1921:    1922:    1923:    1924:    1925:    1926:    1927:
```

```
           Words not
           in bounds
 ESK00DEF         0
 ESK00MAC         0
 ESKAHMAC         0
  ESKAH31       579

Used            579
Remaining

Total microwords used in memory U: 579
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH31.MIC

Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

; 3 Control ROM Field Definitions
; 548 Register Transfer Macro Definitions
; 1413 Non-transfer Functions
; 1485 Branch Enable Macro Definitions
; 1564 MICRO DIAGNOSTIC DEFINED MACROS
; 1806 MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES
; 2318 TEST F0 INCREMENT VIBA FUNCTION TEST
; 2377 TEST F1 INCREMENT IPA FUNCTION TEST
; 2433 TEST F2 AUTO RELOAD TEST 1
; 2540 TEST F3 AUTO RELOAD TEST 2
; 2677 TEST F4 AUTO RELOAD TEST 3
; 2812 TEST F5 AUTO RELOAD TEST 4
; 2947 TEST F6 AUTO RELOAD TEST 5

```
                              ;1       .NOLIST
                              ;1804    .LIST
                              ;1805
```

```
                                        ;1806          .TOC    'MICRO TRAP HANDLER AND LSI-MONITER CALL ROUTINES''
                                        ;1807   .REGION/1000,13FF
                                        ;1808   ;+
                                        ;1809   ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                        ;1810   ; WITH A NUMBER, AND LOADS THE D REGISTER WITH THE CONTENTS OF R[OF].
                                        ;1811   ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                        ;1812   ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                        ;1813   ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                        ;1814   ;
                                        ;1815   ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                        ;1816   ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                        ;1817   ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                        ;1818   ;       R[OF] AND DO A RETURNO.
                                        ;1819   ;
                                        ;1820   ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                        ;1821   ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                        ;1822   ; TO THE CONSOLE.
                                        ;1823   ;
                                        ;1824   ;-
U 1100, 0000,003C,1980,0800,0084,7003   ;1825   1100:   SC_K[ZERO],J/TRPH1      ; SYSTEM INIT
U 1101, 0000,003C,0580,0800,0084,7001   ;1826   1101:   SC_K[.1],J/TRPHO        ; DATA UNALIGNED
U 1102, 0000,003C,0980,0800,0084,7001   ;1827   1102:   SC_K[.2],J/TRPHO        ; X PAGE ERROR
U 1103, 0000,003C,0D80,0800,0084,7001   ;1828   1103:   SC_K[.3],J/TRPHO        ; TB MODIFY
U 1104, 0000,003C,1180,0800,0084,7001   ;1829   1104:   SC_K[.4],J/TRPHO        ; TB PROT ERROR
U 1105, 0000,003C,D580,0800,0084,7001   ;1830   1105:   SC_K[.6],J/TRPHO        ; TB MISS
U 1106, 0000,003C,D980,0800,0084,7001   ;1831   1106:   SC_K[.9],J/TRPHO        ; RES FLOAT OPER
U 1107, 0000,003C,5D80,0800,0084,7001   ;1832   1107:   SC_K[.7],J/TRPHO        ; TB PARITY
U 1108, 0000,003C,0180,0800,0084,7001   ;1833   1108:   SC_K[.8],J/TRPHO        ; CACHE PARITY
U 110C, 0000,003C,8580,0800,0084,7003   ;1834   110C:   SC_K[.C],J/TRPH1        ; RDS
U 110D, 0000,003C,8980,0800,0084,7003   ;1835   110D:   SC_K[.D],J/TRPH1        ; TIME OUT
U 110E, 0000,003C,6580,0800,0084,7001   ;1836   110E:   SC_K[.10],J/TRPHO       ; ODD ADDRESS
U 110F, 0000,003C,6180,0800,0084,7003   ;1837   110F:   SC_K[.F],J/TRPH1        ; CS PARITY
U 1001, 0000,003C,81F0,2C00,0000,104F   ;1838   TRPHO:  Q_ID[USTACK]
U 104F, 0C00,003C,01E0,0800,0000,105B   ;1839           Q_D,D_Q
U 105B, 0000,003C,8180,3C00,0000,105F   ;1840           ID[USTACK]_D
U 105F, 0C00,003C,01E0,0800,0000,1109   ;1841           Q_D,D_Q
U 1109, 0000,003C,01C0,0A78,0000,1154   ;1842           Q_R[OF]
U 1154, 0001,2024,0180,0800,0010,1166   ;1843           A[U_Q.ANDNOT.MASK,CLK.UBCC       ; WAS TRAP EXPECTED?
U 1166, 0000,013C,0180,0800,0000,1002   ;1844           Z?                               ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000   ;1845   =0      ALU_Q.AND.MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN
                                        ;1846   ;+
                                        ;1847   ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                        ;1848   ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                        ;1849   ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                        ;1850   ;
                                        ;1851   ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                        ;1852   ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                        ;1853   ;             FAULT STATUS REGISTER
                                        ;1854   ;             SBI ERROR REGISTER
                                        ;1855   ;             TIMEOUT ADDRESS REGISTER
                                        ;1856   ;             MAINTENANCE REGISTER
                                        ;1857   ;             CACHE PARITY REGISTER
                                        ;1858   ;             TB ERROR REGISTER 1
                                        ;1859   ;             TB ERROR REGISTER 0
                                        ;1860   ;-
```

```
U 1003, 0018,0038,1D80,09E8,0000,1004    ;1861   TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,7188    ;1862   =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,1167    ;1863           Q_ID[TBER0]
U 1167, 0001,203C,4DF0,2DB0,0000,1168    ;1864           RC[6]_Q,Q_ID[TBER1]
U 1168, 0001,203C,65F0,2DB8,0000,1169    ;1865           RC[7]_Q,Q_ID[SBI.ERR]
U 1169, 0001,203C,6DF0,2DD8,0000,116A    ;1866           RC[0B]_Q,Q_ID[FAULT]
U 116A, 0001,203C,75F0,2DE0,0000,116B    ;1867           RC[0C]_Q,Q_ID[MAINT]
U 116B, 0001,203C,79F0,2DC8,0000,116C    ;1868           RC[9]_Q,Q_ID[PARITY]
U 116C, 0001,203C,69F0,2DC0,0000,116D    ;1869           RC[8]_Q,Q_ID[TIME.ADDR]
U 116D, 0001,203C,81F0,2DD0,0000,1000    ;1870           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1182    ;1871   1000:   RC[0E]_Q,ERROR1
                                         ;1872   ;+
                                         ;1873   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                         ;1874   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                         ;1875   ;               NEWTST
                                         ;1876   ;               ERLOOP
                                         ;1877   ;               ERROR1
                                         ;1878   ;               ERROR2
                                         ;1879   ;
U 116E, 0000,003C,65F8,0800,0084,716F    ;1880   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 116F, 0818,0038,8D80,0800,0000,1170    ;1881           D_K[.1F]                        ; ...
U 1170, 0D00,003C,0180,0800,0000,1171    ;1882           D_DAL.SC
U 1171, 0000,003C,3D80,3C00,0000,1172    ;1883           ID[PSL]_D                       ; WRITE THE PSL
U 1172, 0818,0038,0580,0800,0000,1173    ;1884           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 1173, 0D00,003C,0180,0800,0000,1174    ;1885           D_DAL.SC
U 1174, 0F00,003C,3180,3C00,0000,1175    ;1886           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 1175, 0000,003C,5D80,3C00,0000,1176    ;1887           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 1176, 0000,003C,3980,3C00,0000,1177    ;1888           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 1177, 0000,003C,2980,3C00,0000,1178    ;1889           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 1178, 0000,003C,4980,3C00,0000,1179    ;1890           ID[TBER0]_D                     ; SHUT OFF THE TB
U 1179, 0818,0038,C180,0800,0000,117A    ;1891           D_K[.FFFF]
U 117A, 0000,003C,6580,3C00,0000,117B    ;1892           ID[SBI.ERR]_D
U 117B, 0F00,003C,6D80,3C00,0000,117C    ;1893           ID[FAULT]_D,D_0
U 117C, 0000,003C,6D80,3C00,0000,117D    ;1894           ID[FAULT]_D
U 117D, 0000,003C,6580,3C00,0000,117E    ;1895           ID[SBI.ERR]_D
U 117E, 0003,003C,0180,09F0,0000,117F    ;1896           RC[0E]_0
U 117F, 0003,003C,0180,0AF8,0000,1180    ;1897           R[0F]_0
U 1180, 0003,003C,0180,09E8,0000,105E    ;1898           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 1181, 0818,0038,0980,0800,0000,105E    ;1899   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 1182, 0810,0038,0180,0978,0000,1183    ;1900   ERROR1: D_RC[0F]
U 1183, 0819,0034,4D80,0800,0000,104E    ;1901           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E    ;1902   104E:   D_D.OR.K[.4],J/CALLCON
U 1184, 0810,0038,0180,0978,0000,1185    ;1903   ERROR2: D_RC[0F]
U 1185, 0819,0034,4D80,0800,0000,105A    ;1904           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E    ;1905   105A:   D_D.OR.K[.6],J/CALLCON
                                         ;1906   105E:
                                         ;1907   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E    ;1908           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                         ;1909   ;+
                                         ;1910   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                         ;1911   ;-
U 13F0, 0000,003C,0180,0800,0000,13F1    ;1912   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2    ;1913   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3    ;1914   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4    ;1915   13F3:   NOP
```

```
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1916   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1917   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1918   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1919   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1920   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1921   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1922   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1923   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1924   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1925   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1926   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1155   ;1927   13FF:   NOP
U 1155, 0000,003C,0180,0800,0000,12AA   ;1928   1155:   NOP
U 12AA, 0000,003C,0180,0800,0000,1186   ;1929   12AA:   NOP
                                        ;1930   ;+
                                        ;1931   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1932   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1933   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1934   ; TYPING IT.
                                        ;1935   ;-
U 1186, 0810,0038,4D80,0978,0000,1187   ;1936   SUBTST: D_RC[OF],KMX/.FF00
U 1187, 0019,4016,4D80,09F8,0000,0001   ;1937           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;1938   ;+
                                        ;1939   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;1940   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;1941   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;1942   ;-
U 1188, 0010,0038,01C0,0978,0000,1189   ;1943   SETRCF: Q_RC[OF]
U 1189, 0019,2034,4DC0,0800,0000,118A   ;1944           Q_Q.AND.K[.FF00]
U 118A, 0019,2032,1D80,09F8,0000,0001   ;1945           RC[OF]_Q.OR.SC,RETURN1
                                        ;1946
                                        ;1947   ; THIS SUBROUTINE IS CALLED TO SET THE DISABLE SBI CYCLE
                                        ;1948   ; AND FORCE MISS BITS IN THE CACHE MAINTENANCE REGISTER.
                                        ;1949   ; UPON RETURNING THE PREVIOUS CONTENTS OF D, Q AND SC
                                        ;1950   ; ARE LOST.
U 118B, 0F18,0038,C1F8,0800,0000,1006   ;1951   CSOFF:  D_0,Q_0,ALU_K[.FFFF]
U 1006, 0500,003D,0380,0800,0000,11EE   ;1952   =0      D_D.LEFT,SI77,CALL,J/DC9
U 1007, 0000,003C,8580,0800,0084,718C   ;1953           SC_K[.C]
U 118C, 0D00,003C,0180,0800,0000,118D   ;1954           D_DAL.SC
U 118D, 0000,003E,7580,3C00,0000,0001   ;1955           ID[MAINT]_D,RETURN1
                                        ;1956   ; THIS SUBROUTINE IS CALLED TO SET THE FORCE CACHE MISS
                                        ;1957   ; BITS FOR EACH GROUP IN THE MAINTENANCE REGISTER ON THE ID BUS.
U 118E, 0818,0038,0DF8,0800,0000,118F   ;1958   COFF:   D_K[.3],Q_0
U 118F, 0000,003C,6180,0800,0084,7190   ;1959           SC_K[.F]
U 1190, 0D00,003C,0180,0800,0000,1191   ;1960           D_DAL.SC
U 1191, 0000,003E,7580,3C00,0000,0001   ;1961           ID[MAINT]_D,RETURN1
                                        ;1962   ; THIS SUBROUTINE IS CALLED TO DISABLE SBI CYCLES BY SETTING THE
                                        ;1963   ; APPROPRIATE BIT IN THE SBI MAINTENANCE REGISTER.
U 1192, 0000,003C,8580,0800,0084,7193   ;1964   SOFF:   SC_K[.C]
U 1193, 0803,001C,0180,0800,0000,1194   ;1965           ALU_NOT.MASK,D_ALU
U 1194, 0000,003E,7580,3C00,0000,0001   ;1966           ID[MAINT]_D,RETURN1
                                        ;1967   ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                        ;1968   ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                        ;1969   ; CERTAIN TRAPS.
                                        ;1970   =0
```

```
U 1008, 0000,003D,0180,0800,0000,11F2   ;1971    DC.DE:  CALL,J/DCD
U 1009, 0000,003C,0180,0800,0000,100A   ;1972            NOP
U 100A, 0000,003D,0180,0800,0000,11F3   ;1973    =0      CALL,J/DCE
U 100B, 0000,003E,0180,0800,0000,0001   ;1974            RETURN1
                                        ;1975    ; THESE SUBROUTINES ARE USED TO WRITE THE TB. R[8]
                                        ;1976    ; IS ASSUMED TO CONTAIN THE PTE TO BE WRITTEN. THE
                                        ;1977    ; VA SHOULD BE SET UP BEFORE CALLING THESE ROUTINES.
                                        ;1978    ; MME WILL BE SET HERE. UPON RETURN THE CONTENTS
                                        ;1979    ; OF TBER1 IS LEFT IN Q. THE PREVIOUS CONTENTS OF
                                        ;1980    ; D AND Q ARE LOST.
                                        ;1981    ; THIS ROUTINE WRITES GROUP 1
                                        ;1982    =0
U 100C, 0F00,003D,0180,0800,0000,11ED   ;1983    TBWR1:  D_0,CALL,J/DC8
U 100D, 0100,003C,0180,0800,0000,100E   ;1984    TBWR:   D_D.LEFT2,SI/ZERO
U 100E, 0100,003D,0180,0800,0000,11E5   ;1985    =0      D_D.LEFT2,SI/ZERO,CALL,J/DC0
U 100F, 0100,003C,0180,0800,0000,1010   ;1986            D_D.LEFT2,SI/ZERO
U 1010, 0100,003D,0180,0800,0000,11E6   ;1987    =0      D_D.LEFT2,SI/ZERO,CALL,J/DC1
U 1011, 0800,003C,4980,3E40,0000,1195   ;1988    TBWRA:  ID[TBER0]_D,D_R[8]
U 1195, 0000,003C,4180,3C00,0000,1196   ;1989            ID[TBUF]_D
U 1196, 0000,003E,4DF0,2C00,0000,0001   ;1990            Q_ID[TBER1],RETURN1
                                        ;1991    ; ROUTINE TO WRITE GROUP 0
                                        ;1992    =0
U 1012, 0F00,003D,0180,0800,0000,11E9   ;1993    TBWR0:  D_0,CALL,J/DC4
U 1013, 0000,003C,0180,0800,0000,100D   ;1994            J7TBWR
                                        ;1995    ; ROUTINE TO WRITE BOTH GROUP 0 AND 1
                                        ;1996    =0
U 1014, 0F00,003D,0180,0800,0000,11ED   ;1997    TBWRB:  D_0,CALL,J/DC8
U 1015, 0500,003C,0180,0800,0000,100D   ;1998            D_D.LEFT,SI/ZERO,J/TBWR
                                        ;1999    ; THIS ROUTINE WRITES THE TB RANDOMLY.
U 1197, 0818,0038,0580,0800,0000,1011   ;2000    TBWRAN: D_K[.1],J/TBWRA
                                        ;2001    ; THIS ROUTINE IS USED TO SIMULATE AN ADDRESS TRANSLATION.
                                        ;2002    ; THE VIRTUAL ADDRESS SHOULD BE PLACED IN R[5], THE PTE IN
                                        ;2003    ; R[6] AND THE RESULTING PHYSICAL ADDRESS (AS IT WOULD APPEAR IN THE
                                        ;2004    ; TIME OUT ADDRESS REGISTER) WILL BE LEFT IN
                                        ;2005    ; R[7]. THE PREVIOUS CONTENTS OF D, Q AND SC ARE LOST.
                                        ;2006    =0
U 1016, 0800,003D,0180,0A30,0000,11E5   ;2007    RELSUB: D_R[6],CALL,J/DC0
U 1017, 0500,003C,D980,0A28,0084,7018   ;2008            D_D.LEFT,SI/ZERO,SC_K[.9],LAB_R[5]
U 1018, 0003,0011,01C0,0800,0000,11E5   ;2009    =0      ALU_MASK+1,Q_ALU,CALL,J/DC0
U 1019, 001C,0024,01C0,0800,0000,1198   ;2010            ALU_LA[ANDNOT]Q,Q_ALU
U 1198, 081D,0030,0180,0800,0000,1199   ;2011            ALU_D[OR]Q,D_ALU
U 1199, 0200,003C,0180,0800,0000,119A   ;2012            D_D.RIGHT2,SI/ZERO
U 119A, 0001,003E,0180,0AB8,0000,0001   ;2013            R[7]_D,RETURN1
                                        ;2014    ; THIS SUBROUTINE IS CALLED TO RFLOCATE THE VA, GET THE
                                        ;2015    ; TIME OUT ADDRESS REGISTER AND COMPARE IT TO THE CONTENTS OF R[7].
                                        ;2016    ; RETURN3 IF THEY ARE EQUAL;  RETURN 2 IF THEY ARE NOT EQUAL;
                                        ;2017    ; AND RETURN1 IF A UTRAP OCCURS. THE R[F] TRAP FLAGS WILL BE SET AS
                                        ;2018    ; INDICATED IN R[E].
U 119B, 0000,003C,0180,0A70,0000,119C   ;2019    RELCHK: LAB_R[0E]
U 119C, 0000,003C,0180,52F8,0000,119D   ;2020            R[0F]_LA,FS/MCT,MCT/READ.V.WCHK ; DO THE REFERNCE
U 119D, 0800,003C,69F0,2E78,0000,119E   ;2021            Q_ID[TIME.ADDR],D_R[0F]
U 119E, 0018,0038,1980,0AF8,0000,119F   ;2022            ALU_0(K),R[0F]_ALU
U 119F, 0000,003C,0180,0A70,0000,11A0   ;2023            LAB_R[0E]
U 11A0, 001C,2000,0180,0800,0010,11A1   ;2024            ALU_LA[A-B]D,CLK.UBCC           ; SEE IF A TRAP OCCURRED.
U 11A1, 0000,013C,0180,0800,0000,101A   ;2025            Z?
```

```
U 101A, 0001,003E,0180,09F0,0000,0001    =0      RC[OE]_D,RETURN1                 ; TRAPPED SO RETURN1.
U 101B, 0000,003C,0180,0800,0000,101C            NOP
U 101C, 0F00,003D,0180,0800,0000,11F3    =0      D_0,CALL,J/DCE                   ; MASK OFF THE UPPER 4 BITS
U 101D, 0500,003C,0180,0800,0000,11A2            D_D.LEFT,SI/ZERO
U 11A2, 0001,003C,0180,0800,0082,11A3            SC_D
U 11A3, 0803,0010,0180,0800,0000,11A4            ALU_MASK+1,D_ALU
U 11A4, 001D,2024,01C0,0800,0000,11A5            ALU_Q[ANDNOT]D,Q_ALU
U 11A5, 0800,003C,0180,0A38,0000,11A6            D_R[7]                           ; SEE IF ADDRESS RELOCATED
U 11A6, 0018,0038,0D80,09F8,0000,11A7            RC[OF]_K[.3]
U 11A7, 0001,003C,0180,09F0,0000,11A8            RC[OE]_D
U 11A8, 0001,203C,0180,09E8,0000,11A9            RC[OD]_Q
U 11A9, 001D,2000,0180,0800,0010,11AA            ALU_Q-D,CLK.UBCC                 ; PROPERLY.
U 11AA, 0000,013C,0180,0800,0000,101E            Z?
U 101E, 0000,003E,0180,0800,0000,0002    =0      RETURN2                          ; INCORRECT.
U 101F, 0000,003E,0180,0800,0000,0003            RETURN3                          ; OK
                                         ; THIS SUBROUTINE IS CALLED TO SEE IF THE VA IS A MISS IN THE TB.
                                         ; IF NO TRAP OCCURS WHEN THE REFERNCE IS MADE EXECUTE A RETURN1.
                                         ; IF A NON TB MISS TRAP OCCURS ON THE REFERENCE THEN EXECUTE
                                         ; A RETURN2. IF A TB MISS TRAP OCCURS RETURN3.
U 11AB, 0000,003C,0180,0A70,0000,11AC    MISS:   LAB_R[OE]
U 11AC, 0000,003C,0180,52F8,0000,11AD            R[OF]_LA,FS/MCT,MCT/READ.V.WCHK ; SHOULD TRAP HERE IF MISS
U 11AD, 0800,003C,0180,0A78,0000,11AE            D_R[OF]
U 11AE, 0018,0038,1980,0AF8,0000,11AF            ALU_O(K),R[OF]_ALU
U 11AF, 0000,003C,0180,0A70,0000,11B0            LAB_R[OE]
U 11B0, 0001,003C,0180,09F0,0000,11B1            RC[OE]_D
U 11B1, 001C,2000,0180,0800,0010,11B2            ALU_LA[A-B]D,CLK.UBCC            ; SEE IF A TRAP OCCRRED.
U 11B2, 0000,013C,0180,0800,0000,1020            Z?
U 1020, 0000,003C,0180,0800,0000,11B3    =0      J/MISSA
U 1021, 0000,003E,0180,0800,0000,0001            RETURN1                          ; NO TRAP SO RETURN1.
U 11B3, 0000,003C,D580,0800,0084,71B4    MISSA:  SC_K[.6]                         ; IF A TRAP OCCURRED SEE
U 11B4, 0001,0024,0180,0800,0010,11B5            ALU_D.ANDNOT.MASK,CLK.UBCC       ; IF IT WAS A TB MISS TRAP.
U 11B5, 0000,013C,0180,0800,0000,1022            Z?
U 1022, 0000,003E,0180,0800,0000,0002    =0      RETURN2                          ; NOT TB MISS.
U 1023, 0000,003E,0180,0800,0000,0003            RETURN3                          ; TB MISS.
                                         ; THESE SUBROUTINES ARE CALLED TO SEE IF THE VA IS A HIT.
                                         ; RETURN1 IF A NON TB MISS TRAP OCCURS. RETURN2 IF A TB MISS
                                         ; TRAP OCCURS. RETURN3 IF NO TRAP OCCURS BUT THE APPROPRIATE
                                         ; HIT/MISS BIT IN TBERO IS INCORRECT.
                                         ; RETURN4 IF NO TRAP OCCURS AND THE HIT/MISS BIT IS SET.
                                         ; CHECK HIT IN GROUP 0.
U 11B6, 0000,003C,D580,0A70,0084,71B7    HIT0:   LAB_R[OE],SC_K[.6]
U 11B7, 0000,003C,0180,52F8,0000,11B8    HIT:    R[OF]_LA,FS/MCT,MCT/READ.V.WCHK        ; NO TRAP IF HIT
U 11B8, 0800,003C,49F0,2E78,0000,11B9            Q_ID[TBERO],D_R[OF]
U 11B9, 0018,0038,1980,0AF8,0000,11BA            ALU_O(K),R[OF]_ALU
U 11BA, 0001,203C,0180,09F0,0000,11BB            RC[OE]_Q
U 11BB, 0000,003C,0180,0A70,0000,11BC            LAB_R[OE]
U 11BC, 001C,2000,0180,0800,0010,11BD            ALU_LA[A-B]D,CLK.UBCC                  ; SEE IF TRAP OCCURRED.
U 11BD, 0000,013C,0180,0800,0000,1024            Z?
U 1024, 0000,003C,0180,0800,0000,11BF    =0      J/HITA                           ; TRAP OCCURRED.
U 1025, 0001,2024,0180,0800,0010,11BE            ALU_Q.ANDNOT.MASK,CLK.UBCC       ; NO TRAP BUT IS HIT/MISS BIT SET?
U 11BE, 0000,013C,0180,0800,0000,1026            Z?
U 1026, 0000,003E,0180,0800,0000,0004    =0      RETURN4                          ; SET SO IT WAS A HIT.
U 1027, 0000,003E,0180,0800,0000,0003            RETURN3                          ; CLEAR SO REFERENCE WAS A MISS.
U 11BF, 0000,003C,D580,0800,0084,71C0    HITA:   SC_K[.6]                         ; TRAPPED, SO SEE IF TB MISS TRAP.
U 11C0, 0001,0024,0180,0800,0010,11C1            ALU_D.ANDNOT.MASK,CLK.UBCC
```

```
U 11C1, 0000,013C,0180,0800,0000,1028   ;2081           Z?
U 1028, 0000,003E,0180,0800,0000,0001   ;2082   =0      RETURN1                         ; NOT TB MISS TRAP.
U 1029, 0000,003E,0180,0800,0000,0002   ;2083           RETURN2                         ; TB MISS TRAP OCCURRED.
                                        ;2084   ; CHECK HIT IN GROUP 1.
U 11C2, 0000,003C,5D80,0A70,0084,71B7   ;2085   HIT1:   LAB_R[0E],SC_K[.7],J/HIT
                                        ;2086   ; THIS SUBROUTINE IS USED THROUGHOUT THE TB TESTS TO GENERATE
                                        ;2087   ; A SET OF CONSTANTS. UPON RETURNING FROM THIS ROUTINE THE
                                        ;2088   ; SCRATCH PAD REGISTERS HAVE BEEN SET UP TO CONTAIN THE
                                        ;2089   ; FOLLOWING DATA PATTERNS:
                                        ;2090   ;
                                        ;2091   ;       R[0B]           7FFFC000
                                        ;2092   ;       R[0C]           A4000000
                                        ;2093   ;       R[0D]           001FFFFF
                                        ;2094   ;
                                        ;2095   ;       RC[0]           A4155555
                                        ;2096   ;       RC[1]           4CCCC000
                                        ;2097   ;       RC[2]           0AAAAA80
                                        ;2098   ;
                                        ;2099   ;       RC[3]           A4199999
                                        ;2100   ;       RC[4]           55554000
                                        ;2101   ;       RC[5]           0CCCCC80
                                        ;2102   ;
                                        ;2103   ;       RC[6]           A40AAAAA
                                        ;2104   ;       RC[7]           33330000
                                        ;2105   ;       RC[8]           05555500
                                        ;2106   ;
                                        ;2107   ;       RC[9]           A4066666
                                        ;2108   ;       RC[0A]          2AAA8000
                                        ;2109   ;       RC[0B]          03333300
                                        ;2110   ;
U 11C3, 0F18,0038,0580,0800,0000,11C4   ;2111   TBWPTP: D_0,ALU_K[.1]
U 11C4, 0218,0038,0B80,0800,0000,11C5   ;2112           D_D.RIGHT2,SI/7,ALU_K[.2]
U 11C5, 0218,0038,0B80,0800,0000,11C6   ;2113           D_D.RIGHT2,SI/7,ALU_K[.2]
U 11C6, 0200,003C,0380,0800,0000,11C7   ;2114           D_D.RIGHT2,SI/7
U 11C7, 0001,003C,0180,0AE0,0000,11C8   ;2115           R[0C]_D
U 11C8, 0000,003C,6180,0800,0084,71C9   ;2116           SC_K[.F]
U 11C9, 0043,0010,0180,0AD8,0000,11CA   ;2117           ALU_MASK+1,R[0B]_ALU.RIGHT,SI/ZERO
U 11CA, 081B,0000,0580,0800,0000,11CB   ;2118           D_0-K[.1]
U 11CB, 0018,0038,21C0,0800,0000,11CC   ;2119           Q_K[.14]
U 11CC, 0019,2014,0580,0800,0082,11CD   ;2120           ALU_Q+K[.1],SC_ALU
U 11CD, 0003,001C,01C0,0800,0000,11CE   ;2121           ALU_NOT.MASK,Q_ALU
U 11CE, 001D,2014,0180,0AE8,0000,102A   ;2122           ALU_Q[A+B]D,R[0D]_ALU
U 102A, 0000,003D,0180,0800,0000,11F6   ;2123   =0      CALL,J/DC.5
U 102B, 0000,003C,0180,0A68,0000,11CF   ;2124           LAB_R[0D]
U 11CF, 081C,2034,0180,0800,0000,11D0   ;2125           ALU_LA[AND]D,D_ALU
U 11D0, 081C,2030,0180,0A60,0000,11D1   ;2126           LAB_R[0C],ALU_[A[OR]D,D_ALU
U 11D1, 0001,003C,0180,0980,0000,102C   ;2127           RC[0]_D
U 102C, 0001,003D,0180,0AB0,0000,1052   ;2128   =0      R[6]_D,CALL,J/DC.C
U 102D, 0000,003C,0180,0A58,0000,11D2   ;2129           LAB_R[0B]
U 11D2, 081C,2034,0180,0988,0000,102E   ;2130           ALU_LA[AND]D,D_ALU,RC[1]_ALU
U 102E, 0001,003D,0180,0AA8,0000,1016   ;2131   =0      R[5]_D,CALL,J/RELSUB
U 102F, 0001,003C,0180,0990,0000,1030   ;2132           RC[2]_D
U 1030, 0000,003D,0180,0800,0000,11F8   ;2133   =0      CALL,J/DC.9
U 1031, 0000,003C,0180,0A68,0000,11D3   ;2134           LAB_R[0D]
U 11D3, 081C,2034,0180,0800,0000,11D4   ;2135           ALU_LA[AND]D,D_ALU
```

```
U 11D4, 081C,2030,0180,0A60,0000,11D5   ;2136             LAB_R[OC],ALU_LA[OR]D,D_ALU
U 11D5, 0001,003C,0180,0998,0000,1032   ;2137             RC[3]_D
U 1032, 0001,003D,0180,0AB0,0000,11F6   ;2138   =0        R[6]_D,CALL,J/DC.5
U 1033, 0000,003C,0180,0A58,0000,11D6   ;2139             LAB_R[OB]
U 11D6, 081C,2034,0180,09A0,0000,1034   ;2140             ALU_LA[AND]D,D_ALU,RC[4]_ALU
U 1034, 0001,003D,0180,0AA8,0000,1016   ;2141   =0        R[5]_D,CALL,J/RELSUB
U 1035, 0001,003C,0180,09A8,0000,1036   ;2142             RC[5]_D
U 1036, 0000,003D,0180,0800,0000,104A   ;2143   =0        CALL,J/DC.A
U 1037, 0000,003C,0180,0A68,0000,11D7   ;2144             LAB_R[OD]
U 11D7, 081C,2034,0180,0800,0000,11D8   ;2145             ALU_LA[AND]D,D_ALU
U 11D8, 081C,2030,0180,0A60,0000,11D9   ;2146             LAB_R[OC],ALU_[A[OR]D,D_ALU
U 11D9, 0001,003C,0180,09B0,0000,1038   ;2147             RC[6]_D
U 1038, 0001,003D,0180,0AB0,0000,1056   ;2148   =0        R[6]_D,CALL,J/DC.3
U 1039, 0000,003C,0180,0A58,0000,11DA   ;2149             LAB_R[OB]
U 11DA, 081C,2034,0180,09B8,0000,103A   ;2150             ALU_LA[AND]D,D_ALU,RC[7]_ALU
U 103A, 0001,003D,0180,0AA8,0000,1016   ;2151   =0        R[5]_D,CALL,J/RELSUB
U 103B, 0001,003C,0180,09C0,0000,103C   ;2152             RC[8]_D
U 103C, 0000,003D,0180,0800,0000,1054   ;2153   =0        CALL,J/DC.6
U 103D, 0000,003C,0180,0A68,0000,11DB   ;2154             LAB_R[OD]
U 11DB, 081C,2034,0180,0800,0000,11DC   ;2155             ALU_LA[AND]D,D_ALU
U 11DC, 081C,2030,0180,0A60,0000,11DD   ;2156             LAB_R[OC],ALU_[A[OR]D,D_ALU
U 11DD, 0001,003C,0180,09C8,0000,103E   ;2157             RC[9]_D
U 103E, 0001,003D,0180,0AB0,0000,104A   ;2158   =0        R[6]_D,CALL,J/DC.A
U 103F, 0000,003C,0180,0A58,0000,11DE   ;2159             LAB_R[OB]
U 11DE, 081C,2034,0180,09D0,0000,1040   ;2160             ALU_LA[AND]D,D_ALU,RC[OA]_ALU
U 1040, 0001,003D,0180,0AA8,0000,1016   ;2161   =0        R[5]_D,CALL,J/RELSUB
U 1041, 0001,003E,0180,09D8,0000,0001   ;2162             RC[OB]_D,RETURN1
                                        ;2163   ; THIS ROUTINE GENERATES A CONSTANT WHICH IS
                                        ;2164   ; USED IN THE TB TESTS TO SET THE FLAG WHICH ENABLES
                                        ;2165   ; CERTAIN TRAPS.
U 11DF, 0018,0038,C180,0800,0000,11E0   ;2166   DC.1DE:   ALU_K[.FFFF]
U 11E0, 0500,003C,0380,0800,0000,1042   ;2167             D_D.LEFT,SI/7
U 1042, 0000,003D,0180,0800,0000,11F2   ;2168   =0        CALL,J/DCD
U 1043, 0000,003C,0180,0800,0000,1044   ;2169             NOP
U 1044, 0000,003D,0180,0800,0000,11F3   ;2170   =0        CALL,J/DCE
U 1045, 0000,003E,0180,0800,0000,0001   ;2171             RETURN1
                                        ;2172   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER.
U 11E1, 0118,0038,1B80,0800,0000,11F5   ;2173   S00:      ALU_O(K),D_D.LEFT2,SI/7,J/SX
U 11E2, 0118,0038,0B80,0800,0000,11F5   ;2174   S01:      ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 11E3, 0118,0038,0780,0800,0000,11F5   ;2175   S10:      ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 11E4, 0118,0038,C380,0800,0000,11F5   ;2176   S11:      ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
U 11E5, 0018,0038,1980,0800,0000,11E1   ;2177   DC0:      ALU_O(K),J/S00
U 11E6, 0018,0038,1980,0800,0000,11E2   ;2178   DC1:      ALU_O(K),J/S01
U 11E7, 0018,0038,1980,0800,0000,11E3   ;2179   DC2:      ALU_O(K),J/S10
U 11E8, 0018,0038,1980,0800,0000,11E4   ;2180   DC3:      ALU_O(K),J/S11
U 11E9, 0018,0038,0980,0800,0000,11E1   ;2181   DC4:      ALU_K[.2],J/S00
U 11EA, 0018,0038,0980,0800,0000,11E2   ;2182   DC5:      ALU_K[.2],J/S01
U 11EB, 0018,0038,0980,0800,0000,11E3   ;2183   DC6:      ALU_K[.2],J/S10
U 11EC, 0018,0038,0980,0800,0000,11E4   ;2184   DC7:      ALU_K[.2],J/S11
U 11ED, 0018,0038,0580,0800,0000,11E1   ;2185   DC8:      ALU_K[.1],J/S00
U   EE, 0018,0038,0580,0800,0000,11E2   ;2186   DC9:      ALU_K[.1],J/S01
U 11EF, 0018,0038,0580,0800,0000,11E3   ;2187   DCA:      ALU_K[.1],J/S10
U 11F0, 0018,0038,0580,0800,0000,11E4   ;2188   DCB:      ALU_K[.1],J/S11
U 11F1, 0018,0038,C180,0800,0000,11E1   ;2189   DCC:      ALU_K[.FFFF],J/S00
U 11F2, 0018,0038,C180,0800,0000,11E2   ;2190   DCD:      ALU_K[.FFFF],J/S01
```

```
U 11F3, 0018,0038,C180,0800,0000,11E3   ;2191   DCE:    ALU_K[.FFFF],J/S10
U 11F4, 0018,0038,C180,0800,0000,11E4   ;2192   DCF:    ALU_K[.FFFF],J/S11
U 11F5, 0100,003E,0380,0800,0000,0001   ;2193   SX:     D_D.LEFT2,SI/7,RETURN1
U 11F6, 0018,0038,01C0,0800,0000,1046   ;2194   DC.5:   Q_K[.8]
                                        ;2195   =0
U 1046, 0000,003D,0180,0800,0000,11EA   ;2196   DC.5A:  CALL,J/DC5
U 1047, 0019,2000,05C0,0800,0010,11F7   ;2197           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 11F7, 0000,013C,0180,0800,0000,1048   ;2198           Z?
U 1048, 0000,003C,0180,0800,0000,1046   ;2199   =0      J/DC.5A
U 1049, 0000,003E,0180,0800,0000,0001   ;2200           RETURN1
                                        ;2201   =0
U 104A, 0000,003D,0180,0800,0000,11F6   ;2202   DC.A:   CALL,J/DC.5
U 104B, 0500,003E,0180,0800,0000,0001   ;2203           D_D.LEFT,SI/ZERO,RETURN1
U 11F8, 0018,0038,01C0,0800,0000,104C   ;2204   DC.9:   Q_K[.8]
                                        ;2205   =0
U 104C, 0000,003D,0180,0800,0000,11EE   ;2206   DC.9A:  CALL,J/DC9
U 104D, 0019,2000,05C0,0800,0010,11F9   ;2207           ALU_Q-K[.1],Q_ALU,CLK.UBCC
U 11F9, 0000,013C,0180,0800,0000,1050   ;2208           Z?
U 1050, 0000,003C,0180,0800,0000,104C   ;2209   =0      J/DC.9A
U 1051, 0000,003E,0180,0800,0000,0001   ;2210           RETURN1
                                        ;2211   =0
U 1052, 0000,003D,0180,0800,0000,11F8   ;2212   DC.C:   CALL,J/DC.9
U 1053, 0018,0038,C180,0800,0000,11FA   ;2213           ALU_K[.FFFF]
U 11FA, 0600,003E,0380,0800,0000,0001   ;2214           D_D.RIGHT,SI/7,RETURN1
                                        ;2215   =0
U 1054, 0000,003D,0180,0800,0000,11F8   ;2216   DC.6:   CALL,J/DC.9
U 1055, 0018,0038,0580,0800,0000,11FB   ;2217           ALU_K[.1]
U 11FB, 0100,003E,0380,0800,0000,0001   ;2218           D_D.LEFT2,SI/7,RETURN1
                                        ;2219   =0
U 1056, 0000,003D,0180,0800,0000,11F8   ;2220   DC.3:   CALL,J/DC.9
U 1057, 0018,0038,C180,0800,0000,11FC   ;2221           ALU_K[.FFFF]
U 11FC, 0500,003E,0380,0800,0000,0001   ;2222           D_D.LEFT,SI/7,RETURN1
                                        ;2223   ; THIS ROUTINE IS CALLED TO PUT THE CONSTANT 0AAAAAAAA IN THE D REGISTER.
U 11FD, 0F18,0038,5DC0,0800,0000,1058   ;2224   DCLA:   D_0,Q_K[.7]
                                        ;2225   =0
U 1058, 0000,003D,0180,0800,0000,11EF   ;2226   DCLA1:  CALL,J/DCA
U 1059, 0001,203C,0180,0800,0010,11FE   ;2227           ALU_Q,CLK.UBCC
U 11FE, 0000,013C,0180,0800,0000,105C   ;2228           Z?
U 105C, 0019,2000,05C0,0800,0000,1058   ;2229   =0      Q_Q-K[.1],J/DCLA1
U 105D, 0000,003E,0180,0800,0000,0001   ;2230           RETURN1
                                        ;2231   ; THESE SUBROUTINES ARE CALLED TO EXECUTE A READ AND CHECK
                                        ;2232   ; THE CACHE HIT/MISS BITS IN THE MAINTENANCE REGISTER.
                                        ;2233   ; IF A UTRAP OCCURS A RETURN1 WILL BE EXECUTED. IF NO
                                        ;2234   ; UTRAP OCCURS BUT THE HIT/MISS BITS ARE INCORRECT A RETURN2
                                        ;2235   ; IS EXECUTED OTHERWISE A RETURN3 IS EXECUTED. UPON RETURNING
                                        ;2236   ; TO THE CALLING ROUTINE (IF A RETURN3 IS INVOKED) THE D REGISTER
                                        ;2237   ; WILL CONTAIN THE READ DATA.
                                        ;2238   =0
U 1060, 0F00,003D,0180,0800,0000,11EB   ;2239   RHOH1:  D_0,CALL,J/DC6
U 1061, 0000,003C,0180,0800,0000,1067   ;2240           J7READ
                                        ;2241   =0
U 1062, 0F00,003D,0180,0800,0000,11E7   ;2242   RHOM1:  D_0,CALL,J/DC2
U 1063, 0000,003C,0180,0800,0000,1067   ;2243           J7READ
                                        ;2244   =0
U 1064, 0F00,003D,0180,0800,0000,11E9   ;2245   RMOH1:  D_0,CALL,J/DC4
```

```
U 1065, 0000,003C,0180,0800,0000,1067   ;2246           J/READ
                                        ;2247   =0
U 1066, 0F00,003C,0180,0800,0000,1067   ;2248   RMOM1:  D_0,J/READ
U 1067, 0000,003C,01F8,0800,0084,71FF   ;2249   READ:   SC_K[.8],Q_0            ; CALCULATE THE EXPECTED HIT/MISS BITS
U 11FF, 0D00,003C,0180,0800,0000,1200   ;2250           D_DAL.SC
U 1200, 0001,003C,0180,09E8,0000,1201   ;2251           RC[0D]_D
U 1201, 0000,003C,0180,0A70,0000,1202   ;2252           LAB_R[0E]
U 1202, 0000,003C,0180,52F8,0000,1203   ;2253           R[0F]_LA,FS/MCT,MCT/READ.V.WCHK
U 1203, 0001,003C,0180,09D0,0000,1204   ;2254           RC[0A]_D
U 1204, 0000,003C,75F0,2C00,0000,1205   ;2255           Q_ID[MAINT]
U 1205, 0800,003C,0180,0A78,0000,1206   ;2256           D_R[0F]
U 1206, 0003,003C,0180,0AF8,0000,1207   ;2257           R[0F]_0
U 1207, 0001,203C,0180,09E0,0000,1208   ;2258           RC[0C]_Q
U 1208, 0000,003C,01C0,0A70,0000,1209   ;2259           Q_R[0E]
U 1209, 0001,003C,0180,09C8,0000,120A   ;2260           RC[9]_D
U 120A, 001D,2000,0180,0800,0010,120B   ;2261           ALU_Q-D,CLK.UBCC
U 120B, 0000,013C,0180,0800,0000,1068   ;2262           Z?
U 1068, 0000,003C,0180,0800,0000,1212   ;2263   =0      J/RERR
U 1069, 0818,0038,D5F8,0800,0000,120C   ;2264           Q_0,D_K[.6]
U 120C, 0000,003C,0180,0800,0084,720D   ;2265           SC_K[.8]
U 120D, 0D10,0038,01C0,0960,0000,120E   ;2266           D_DAL.SC,Q_RC[0C]
U 120E, 001D,2034,01C0,0800,0000,120F   ;2267           ALU_Q[AND]D,Q_ALU
U 120F, 0810,0038,0180,0968,0000,1210   ;2268           D_RC[0D]
U 1210, 001D,2000,0180,0800,0010,1211   ;2269           ALU_Q-D,CLK.UBCC
U 1211, 0000,013C,0180,0800,0000,106A   ;2270           Z?
U 106A, 0000,003E,0180,0800,0000,0002   ;2271   =0      RETURN2
U 106B, 0810,003A,0180,0950,0000,0003   ;2272           D_RC[0A],RETURN3
U 1212, 0000,003C,79F0,2C00,0000,1213   ;2273   RERR:   Q_ID[PARITY]
U 1213, 0001,203E,0180,09E8,0000,0001   ;2274           RC[0D]_Q,RETURN1
                                        ;2275   ; THIS ROUTINE IS CALLED TO DO WRITES TO THE CACHE.
                                        ;2276   ; AN MCT=WRITE.V.WCHK IS USED. IF AUTRAP OCCURS THEN RETURN1
                                        ;2277   ; ELSE RETURN2.
U 1214, 0000,003C,0180,0A70,0000,1215   ;2278   WRITE:  LAB_R[0E]
U 1215, 0000,003C,0180,32F8,0000,1216   ;2279           R[0F]_LA,FS/MCT,MCT/WRITE.V.WCHK
U 1216, 0800,003C,0180,0A78,0000,1217   ;2280           D_R[0F]
U 1217, 0003,003C,0180,0AF8,0000,1218   ;2281           R[0F]_0
U 1218, 0000,003C,01C0,0A70,0000,1219   ;2282           Q_R[0E]
U 1219, 001D,2000,0180,0800,0010,121A   ;2283           ALU_Q-D,CLK.UBCC
U 121A, 0000,013C,0180,0800,0000,106C   ;2284           Z?
U 106C, 0000,003C,0180,0800,0000,1212   ;2285   =0      J/RERR                  ; UTRAPPED.
U 106D, 0000,003E,0180,0800,0000,0002   ;2286           RETURN2                 ; OK NO UTRAP.
                                        ;2287   ; THESE SUBROUTINES ARE CALLED TO SET UP THE SBI MAINTENANCE
                                        ;2288   ; REGISTER. SPECIFICALLY THEY SET UP THE MAINTENANCE REGISTER'S
                                        ;2289   ; CACHE CONTROL BITS <16:13> AND THE DISABLE SBI CYCLE BIT <12>.
                                        ;2290   ; NOTE THAT THE DISSABLE SBI CYCLE BIT <12> IS ASSERTED BY EACH ROUTINE.
U 121B, 0000,003C,8580,0800,0084,721C   ;2291   S1:     SC_K[.C]
U 121C, 0801,001C,0180,0800,0000,121D   ;2292           ALU_D.ORNOT.MASK,D_ALU
U 121D, 0000,003E,7580,3C00,0000,0001   ;2293           ID[MAINT]_D,RETURN1
                                        ;2294   ; SET FORCE REPLACE GROUP ZERO BIT
U 121E, 0F00,003C,0180,0800,0000,121F   ;2295   R0S:    D_0
U 121F, 0000,003C,6180,0800,0084,7220   ;2296   S2:     SC_K[.F]
U 1220, 0000,003C,0580,0800,0084,8221   ;2297           SC_SC-K[.1]
U 1221, 0801,001C,0180,0800,0000,121B   ;2298   S3:     ALU_D.ORNOT.MASK,D_ALU,J/S1
                                        ;2299   ; SET FORCE REPLACE GROUP 1 BIT
U 1222, 0F00,003C,0180,0800,0000,1223   ;2300   R1S:    D_0
```

```
U 1223, 0000,003C,8980,0800,0084,7221   ;2301   S4:     SC_K[.D],J/S3
                                         ;2302   ; SET FORCE MISS GROUP 0 BIT
U 1224, 0F00,003C,0180,0800,0000,1225   ;2303   M0S:    D_0
U 1225, 0000,003C,6580,0800,0084,7221   ;2304   S5:     SC_K[.10],J/S3
                                         ;2305   ; SET FORCE MISS GROUP 1 BIT
U 1226, 0F00,003C,0180,0800,0000,1227   ;2306   M1S:    D_0
U 1227, 0000,003C,6180,0800,0084,7221   ;2307   S6:     SC_K[.F],J/S3
                                         ;2308   ; SET FORCE MISS GROUP 0 AND FORCE MISS GROUP ONE BITS
U 1228, 0F00,003C,0180,0800,0000,1229   ;2309   M10S:   D_0
U 1229, 0000,003C,6180,0800,0084,722A   ;2310           SC_K[.F]
U 122A, 0801,001C,0180,0800,0000,1225   ;2311   S7:     ALU_D.ORNOT.MASK,D_ALU,J/S5
                                         ;2312   ; SET FORCE REPLACE GROUP 0 AND FORCE MISS GROUP ONE BITS
U 122B, 0F00,003C,0180,0800,0000,122C   ;2313   ROM1S:  D_0
U 122C, 0000,003C,6180,0800,0084,722D   ;2314           SC_K[.F]
U 122D, 0801,001C,0180,0800,0000,121F   ;2315           ALU_D.ORNOT.MASK,D_ALU,J/S2
                                         ;2316   ; SET FORCE REPLACE GROUP 1 FORCE MISS GROUP 0 BITS
U 122E, 0F00,003C,8980,0800,0084,722A   ;2317   R1M0S:  D_0,SC_K[.D],J/S7
```

```
                                         ;2318          .PAGE   "TEST F0        INCREMENT VIBA FUNCTION TEST"
                                         ;2319   ;******************************************************************
                                         ;2320   ;++
                                         ;2321   ; TEST  F0      INCREMENT VIBA FUNCTION TEST
                                         ;2322   ;
                                         ;2323   ; TEST DESCRIPTION
                                         ;2324   ;      THIS IS A TEST OF THE INCREMENT VIBA FUNCTION.
                                         ;2325   ;
                                         ;2326   ; LOGIC DESCRIPTION
                                         ;2327   ;      THIS TESTS LOGIC ON THE TBM, SBL, IDP AND
                                         ;2328   ;      DATA PATH MODULES
                                         ;2329   ;
                                         ;2330   ; ERROR DESCRIPTION
                                         ;2331   ;      EXPECTED VIBA
                                         ;2332   ;      GOT VIBA
                                         ;2333   ;      VIBA BEFORE INCREMENT
                                         ;2334   ;
                                         ;2335   ;--
                                         ;2336   ;******************************************·*********************
                                         ;2337   =0
U 106E, 0000,003D,0180,0800,0000,116E    ;2338   INCIVA: NEWTST
U 106F, 1F00,003C,0180,0800,0000,1070    ;2339           D_0,IBC/STOP               ; TURN OFF IB
U 1070, 0000,003D,4980,3C00,0000,1192    ;2340   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 1071, 081B,0000,0580,0800,0000,122F    ;2341           ALU_0-K[.1],D_ALU          ; GENERATE A MASK
U 122F, 0100,003C,0180,0800,0000,1230    ;2342           D_D.LEFT2,SI/ZERO
U 1230, 0001,003C,0180,0A88,0000,1231    ;2343           R[1]_D                     ; R[1]=FFFFFFFC
U 1231, 0818,0038,5180,0800,0000,1232    ;2344           D_K[.1E]
U 1232, 0019,0000,0580,0A90,0000,1233    ;2345           ALU_D-K[.1],R[2]_ALU       ; SET UP A COUNTER, R[2]=1D
U 1233, 0018,0038,0D80,09F8,0000,1072    ;2346           RC[0F]_K[.3]
U 1072, 0000,003D,0180,0800,0000,1181    ;2347   =0      ERLOOP
U 1073, 0018,0038,1980,0800,0200,1234    ;2348   INCVA1: VA_K[ZERO]                 ; INVALIDATE LOCATION 0
U 1234, 0000,003C,0180,9000,0000,1235    ;2349           FS7MCT,MCT/INVALIDATE      ; OF BOTH GROUPS
U 1235, 0000,003C,0180,0803,0000,1236    ;2350           VA_VA+4                    ; INVALIDATE LOCATION 4
U 1236, 0000,003C,0180,9000,0000,1074    ;2351           FS7MCT,MCT/INVALIDATE      ; OF BOTH GROUPS
U 1074, 0000,003D,0180,0800,0000,121E    ;2352   =0      CALL,J/ROS                 ; SET FORCE REPLACE GROUP 0 BIT
U 1075, 0F18,0038,1980,0800,0200,1237    ;2353           VA_K[ZERO],D_0             ; WRITE DATA=00000000 INTO LOCATION 0
U 1237, 0000,003C,0180,9800,0000,1238    ;2354           FS7MCT,MCT/VALIDATE        ; OF GROUP 0
U 1238, 0000,003C,0180,0803,0000,1239    ;2355           VA_VA+4                    ; WRITE DATA=00000000 INTO LOCATION 4
U 1239, 0000,003C,0180,9800,0000,123A    ;2356           FS7MCT,MCT/VALIDATE        ; OF GROUP 0
U 123A, 0000,003C,0180,0A10,0082,123B    ;2357           SC_R[2]                    ; COMPUTE TEST OPERAND
U 123B, 0800,003C,0980,0A08,0084,923C    ;2358           SC_SC+K[.2],D_R[1]
U 123C, 2801,0034,0180,0A80,0000,123D    ;2359           ALU_D.AND.MASK,R[0]_ALU,D_ALU,IBC/FLUSH ; LOAD VIBA
U 123D, 0001,003C,0180,09E0,0000,123E    ;2360           RC[0C]_D
U 123E, 0018,0038,1980,0800,0200,123F    ;2361           VA_K[ZERO]                 : LOAD 0 INTO IPA
U 123F, 0000,003C,0180,6000,0000,1240    ;2362           FS7MCT,MCT/READ.V.NEWPC
U 1240, 3000,003C,0180,0800,0000,1241    ;2363           IBC/START                  ; START IB REFERENCES
U 1241, 0000,003C,0180,F800,0000,1242    ;2364           FS/MCT,MCT/ALLOW.IB.READ ; ALLOW IB READS TO GET VIBA INCREMENT
U 1242, 1000,003C,0180,0800,0000,1243    ;2365           IBC/STOP                   ; STOP IB
U 1243, 0000,003C,0180,0802,0000,1244    ;2366           PCK/PC_IBA                 ; LOAD VIBA INTO PC
U 1244, 0014,0038,01C0,09E8,0000,1245    ;2367           ALU_PC,RC[0D]_ALU,Q_ALU ; GET RESULT FROM PC
U 1245, 0800,003C,0180,0A00,0000,1246    ;2368           D_R[0]
U 1246, 0819,0014,1180,09F0,0000,1247    ;2369           ALU_D+K[.4],RC[0E]_ALU,D_ALU ; COMPUTE EXPECTED RESULT
U 1247, 001D,2000,0180,0800,0010,1248    ;2370           ALU_Q-D,CLK.UBCC           ; WAS THE RESULT CORRECT?
U 1248, 0000,013C,0180,0800,0000,1076    ;2371           Z?
U 1076, 0000,003D,0180,0800,0000,1182    ;2372   =0      ERROR1                     ; INCREMENT VIBA FUNCTION FAILED
```

```
U 1077, 0000,003C,0180,0A10,0010,1249   ;2373          ALU_R[2],CLK.UBCC       ; HAVE ALL TEST PATTERNS BEEN TRIED
U 1249, 0000,013C,0180,0800,0000,1078   ;2374          Z?
U 1078, 0018,0000,0580,0A90,0000,1073   ;2375   =0     R[2]_LA-K[.1],J/INCVA1  ; IF NOT CONTINUE
U 1079, 0000,003C,0180,0800,0000,107A   ;2376          NOP
```

```
                                     ;2377          .PAGE   "TEST F1        INCREMENT IPA FUNCTION TEST"
                                     ;2378   ;*************************************************************
                                     ;2379   ;++
                                     ;2380   ; TEST  F1      INCREMENT IPA FUNCTION TEST
                                     ;2381   ;
                                     ;2382   ; TEST DESCRIPTION
                                     ;2383   ;       THIS IS A TEST OF THE INCREMENT IPA FUNCTION.
                                     ;2384   ;
                                     ;2385   ; LOGIC DESCRIPTION
                                     ;2386   ;       THIS IS A TEST OF LOGIC ON TBM
                                     ;2387   ;
                                     ;2388   ; ERROR DESCRIPTION
                                     ;2389   ;       EXPECTED IPA
                                     ;2390   ;       GOT IPA
                                     ;2391   ;       IPA BEFORE INCREMENT
                                     ;2392   ;
                                     ;2393   ;--
                                     ;2394   ;*************************************************************
                                     ;2395   =0
U 107A, 0000,003D,0180,0800,0000,116E ;2396   INCIPA: NEWTST
U 107B, 1F00,003C,0180,0800,0000,107C ;2397           D_0,IBC/STOP            ; TURN OFF IB
U 107C, 0000,003D,4980,3C00,0000,1192 ;2398   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 107D, 0818,0038,5980,0800,0000,124A ;2399           D_K[.7F]
U 124A, 0100,003C,0180,0800,0000,124B ;2400           D_D.LEFT2,SI/ZERO
U 124B, 0001,003C,0180,0A88,0000,124C ;2401           R[1]_D                  ; R[1]=1FC, A MASK USED TO GENERATE TEST PATTERNS
U 124C, 0018,0038,D580,0A90,0000,124D ;2402           R[2]_K[.6]              ; INITIALIZE A TEST PATTERN COUNTER
U 124D, 0018,0038,0D80,09F8,0000,107E ;2403           RC[0F]_K[.3]
U 107E, 0000,003D,0180,0800,0000,1181 ;2404   =0      ERLOOP
U 107F, 2018,0038,1980,0800,0000,124E ;2405   INCPA1: ALU_0(K),IBC/FLUSH      ; CLEAR IB AND LOAD 0 INTO VIBA
U 124E, 0000,003C,0180,0A10,0082,124F ;2406           SC_R[2]                 ; GENERATE TEST PATTERN FOR IPA
U 124F, 0800,003C,0980,0A08,0084,9250 ;2407           SC_SC+K[.2],D_R[1]
U 1250, 0801,0034,0180,0A80,0200,1251 ;2408           ALU_D.AND.MASK,R[C]_ALU,VA_ALU,D_ALU ; PUT TEST PATTERN INTO VA
U 1251, 0001,003C,0180,09E0,0000,1252 ;2409           RC[0C]_D
U 1252, 0000,003C,0180,9000,0000,1080 ;2410           FS/MCT,MCT/INVALIDATE   ; INVALIDATE THIS LOCATION IN BOTH GROUPS
U 1080, 0000,003D,0180,0800,0000,121E ;2411   =0      CALL,J/ROS              ; SET FORCE REPLACE GROUP 0 BIT
U 1081, 0F00,003C,0180,0800,0000,1253 ;2412           D_0                     ; WRITE DATA=00000000 AT TEST ADDRESS
U 1253, 0000,003C,0180,9800,0000,1254 ;2413           FS/MCT,MCT/VALIDATE     ; IN GROUP 0
U 1254, 0000,003C,0180,6000,0000,1255 ;2414           FS/MCT,MCT/READ.V.NEWPC ; LOAD THE IPA
U 1255, 3000,003C,0180,0800,0000,1256 ;2415           IBC/START               ; START IB CYCLES
U 1256, 0000,003C,0180,F800,0000,1257 ;2416           FS/MCT,MCT/ALLOW.IB.READ ; ALLOW IB TO READ SO THAT THE INCREMENT IPA FUNCTI
U 1257, 1000,003C,0180,0800,0000,1258 ;2417           IBC/STOP                ; STOP IB
U 1258, 0000,003C,0180,F800,0000,1259 ;2418           FS/MCT,MCT/ALLOW.IB.READ ; ALLOW IB READ TO GET RESULT
U 1259, 0000,003C,69F0,2C00,0000,125A ;2419           Q_ID[TIME.ADDR]         ; GET IPA FROM TIME OUT ADDRESS REG
U 125A, 0000,003C,0188,0800,0000,125B ;2420           Q_Q.LEFT2,SI/ZERO       ; JUSTIFY ADDRESS CORRECTLY IN Q
U 125B, 0000,003C,01A8,0800,0000,125C ;2421           Q_Q.LEFT,SI/ZERO
U 125C, 0000,003C,0180,0800,0000,125D ;2422           Q_Q.RIGHT,SI/ZERO
U 125D, 0001,203C,0180,09E8,0000,125E ;2423           RC[0D]_Q
U 125E, 0800,003C,0180,0A00,0000,125F ;2424           D_R[0]                  ; COMPUTE EXPECTED RESULT
U 125F, 0819,0014,1180,09F0,0000,1260 ;2425           ALU_D+K[.4],D_ALU,RC[0E]_ALU
U 1260, 001D,2000,0180,0800,0010,1261 ;2426           ALU_Q-D,CLK.UBCC        ; WAS RESULT CORRECT?
U 1261, 0000,013C,0180,0800,0000,1082 ;2427           Z?
U 1082, 0000,003D,0180,0800,0000,1182 ;2428   =0      ERROR1                  ; INCREMENT IPA FUNCTION FAILED
U 1083, 0000,003C,0180,0A10,0010,1262 ;2429           ALU_R[2],CLK.UBCC       ; HAVE ALL TEST PATTERNS BEEN TRIED?
U 1262, 0000,013C,0180,0800,0000,1084 ;2430           Z?
U 1084, 0018,0000,0580,0A90,0000,107F ;2431   =0      R[2]_LA-K[.1],J/INCPA1  ; IF NOT CONTINUE
```

```
U 1085, 0000,003C,0180,0800,0000,1086   ;2432           NOP
```

```
                                               .PAGE   "TEST F2        AUTO RELOAD TEST 1"
                                       ;*************************************************************
                                       ;++
                                       ; TEST  F2      AUTO RELOAD TEST 1
                                       ;
                                       ; TEST DESCRIPTION
                                       ;       THIS IS A TEST OF AUTO RELOAD WITH THE TB OFF (MME=0).
                                       ;
                                       ; LOGIC DESCRIPTION
                                       ;       LOGIC ON TBM, DDP,  AND DEP IS TESTED HERE
                                       ;
                                       ; ERROR DESCRIPTION
                                       ;       EXPECTED IPA
                                       ;       GOT IPA
                                       ;       EXPECTED TBER1
                                       ;       GOT TBER1
                                       ;
                                       ;--
                                       ;*************************************************************
                                       =0
U 1086, 0000,003D,0180,0800,0000,116E  ARO:    NEWTST
U 1087, 1F00,003C,0180,0800,0000,1088          D_0,IBC/STOP            ; TURN IB OFF
U 1088, 0000,003D,4980,3C00,0000,1192  =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 1089, 0818,0038,5980,0800,0000,1263          D_K[.7F]                ; GENERATE ADDRESS WHICH ILL RESULT
U 1263, 0100,003C,0180,0800,0000,1264          D_D.LEFT2,SI/ZERO       ; IN AN AUTO RELOAD IF PUT IN IPA AND INCREMENTED
U 1264, 0001,003C,0180,0A80,0000,108A          R[0]_D                  ; R[0]=1FC
U 108A, 081B,0001,0580,0800,0000,11E5  =0      ALU_0-K[.1],D_ALU,CALL,J/DC0 ; GENERATE A MASK USED TO CALCULATE
U 108B, 0200,003C,0180,0800,0000,1265          D_D.RIGHT2,SI7ZERO      ; TEST PATTERNS
U 1265, 0001,003C,0180,0A88,0000,1266          R[1]_D                  ;R[1]=3FFFFFFC
U 1266, 0018,0038,8D80,0A90,0000,1267          R[2]_K[.1F]             ; TEST PATTERN COUNTER
U 1267, 0018,0038,0580,09E0,0000,1268          RC[0C]_K[.1]
U 1268, 0018,0038,1180,09F8,0000,108C          RC[0F]_K[.4]
U 108C, 0000,003D,0180,0800,0000,1181  =0      ERLOOP
U 108D, 0000,003C,0180,0A10,0082,1269  AROA:   SC_R[2]                 ; GENERATE TEST PATTERN
U 1269, 0800,0034,0180,0A08,0000,126A          ALU_R[1].AND.MASK,D_ALU ; PATTERN IS A 0 IN 1'S
U 126A, 0001,003C,0180,0AA8,0000,126B          R[5]_D
U 126B, 2019,0000,1180,0800,0000,126C          ALU_D-K[.4],IBC/FLUSH   ; DECREMENT TEST PATTERN BY FOR AND LOAD VIBA
U 126C, 0000,003C,0180,0A00,0200,126D          VA_R[0]                 ; LOAD 1FC INTO VA
U 126D, 0000,003C,0180,9000,0000,108E          FS7MCT,MCT/INVALIDATE   ; INVALIDATE LOCATION 1FC IN BOTH GROUPS
U 108E, 0000,003D,0180,0800,0000,121E  =0      CALL,J/ROS              ; SET FORCE REPLACE GROUP 0 BIT
U 108F, 0F00,003C,0180,0800,0000,126E          D_0                     ; WRITE DATA=00000000 INTO LOCATION 1FC
U 126E, 0000,003C,0180,9800,0000,126F          FS/MCT,MCT/VALIDATE     ; OF GROUP 0
U 126F, 0000,003C,0180,6000,0000,1270          FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
U 1270, 0018,0038,1980,0800,0200,1271          VA_K[ZERO]              ; CLEAR VA
U 1271, 3000,003C,0180,0800,0000,1272          IBC/START               ; START IB REFERENCES
U 1272, 0000,003C,0180,F800,0000,1273          FS/MCT,MCT/ALLOW.IB.READ ; LET IB DO 1 REFERENCE TO GET IPA INCREMENT AND AU
U 1273, 0000,003C,0180,F800,0000,1274          FS/MCT,MCT/ALLOW.IB.READ
U 1274, 1000,003C,0180,F800,0000,1275          IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; TURN OFF IB
U 1275, 0000,003C,0180,F800,0000,1276          FS/MCT,MCT/ALLOW.IB.READ
U 1276, 0000,003C,69F0,2C00,0000,1277          Q_ID[TIME.ADDR]         ; GET IPA FROM TIME OUT ADDRESS REG
U 1277, 0000,003C,0188,0800,0000,1278          Q_Q.LEFT2,SI/ZERO       ; JUSTIFY ADDRESS PROPERLY IN Q
U 1278, 0000,003C,01A8,0800,0000,1279          Q_Q.LEFT,SI/ZERO
U 1279, 0000,003C,01B0,0800,0000,127A          Q_Q.RIGHT,SI/ZERO
U 127A, 0001,203C,0180,09E8,0000,127B          RC[0D]_Q
U 127B, 0000,003C,4DF0,2C00,0000,127C          Q_ID[TBER1]             ; READ TBER1 TO LOOK AT AUTO RELOAD BIT
```

```
U 127C, 0001,203C,0180,09D8,0000,127D    ;2488          RC[0B]_Q
U 127D, 0800,003C,0180,0A28,0000,127E    ;2489          D_R[5]                   ; SEE IF IPA WAS RELOADED FROM VIBA
U 127E, 080D,0024,0180,0A00,0000,127F    ;2490          LAB_R[0],ALU_D[ANDNOT]LB,D_ALU
U 127F, 0001,003C,0180,09F0,0000,1280    ;2491          RC[0E]_D
U 1280, 0010,0038,01C0,0968,0000,1281    ;2492          Q_RC[0D]
U 1281, 001D,2000,0180,0800,0010,1282    ;2493          ALU_Q-D,CLK.UBCC
U 1282, 0000,013C,0180,0800,0000,1090    ;2494          Z?
U 1090, 0000,003D,0180,0800,0000,1182    ;2495   =0     ERROR1                   ; IPA INCORRECT AFTER AUTO RELOAD
U 1091, 0810,0038,0180,0958,0000,1283    ;2496          D_RC[0B]                 ; SEE IF TBER1 CORRECT AFTER AUTO RELOAD
U 1283, 0819,0034,0580,0800,0000,1284    ;2497          ALU_D[AND]K[.1],D_ALU
U 1284, 0019,0000,0580,0800,0010,1285    ;2498          ALU_D-K[.1],CLK.UBCC
U 1285, 0000,013C,0180,0800,0000,1092    ;2499          Z?
U 1092, 0000,003D,0180,0800,0000,1182    ;2500   =0     ERROR1                   ; TBER1 INCORRECT AFTER AUTO RELOAD
U 1093, 0000,003C,0180,0A10,0082,1286    ;2501          SC_R[2]                  ; NOW USE 1 IN 0'S TEST PATTERN
U 1286, 0800,0024,0180,0A08,0000,1287    ;2502          ALU_R[1].ANDNOT.MASK,D_ALU ; GENERATE TEST PATTERN
U 1287, 0001,003C,0180,0AA8,0000,1288    ;2503          R[5]_D
U 1288, 2019,0000,1180,0800,0000,1289    ;2504          ALU_D-K[.4],IBC/FLUSH    ; LOAD TEST PATTERN MINUS 4 INTO VIBA
U 1289, 0000,003C,0180,0A00,0200,128A    ;2505          VA_R[0]                  ; LOAD 1FC INTO VA
U 128A, 0000,003C,0180,9000,0000,1094    ;2506          FS/MCT,MCT/INVALIDATE    ; INVALIDATE IFC IN BOTH GROUPS
U 1094, 0000,003D,0180,0800,0000,121E    ;2507   =0     CALL,J/ROS               ; SET FORCE REPLACE GROUP 0 BIT
U 1095, 0F00,003C,0180,0800,0000,128B    ;2508          D_0                      ; WRITE DATA=00000000 INTO LOCATION 1FC
U 128B, 0000,003C,0180,9800,0000,128C    ;2509          FS/MCT,MCT/VALIDATE      ; OF GROUP 0
U 128C, 0000,003C,0180,6000,0000,128D    ;2510          FS/MCT,MCT/READ.V.NEWPC  ; LOAD 1FC INTO IPA
U 128D, 0018,0038,1980,0800,0200,128E    ;2511          VA_K[ZERO]               ; CLEAR VA
U 128E, 3000,003C,0180,0800,0000,128F    ;2512          IBC/START                ; START IB REFERENCES
U 128F, 0000,003C,0180,F800,0000,1290    ;2513          FS/MCT,MCT/ALLOW.IB.READ ; ALLOW IB TO DO 1 READ SO
U 1290, 0000,003C,0180,F800,0000,1291    ;2514          FS/MCT,MCT/ALLOW.IB.READ ; THAT IPA GETS INCREMENTED AND
U 1291, 1000,003C,0180,F800,0000,1292    ;2515          IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; AUTO RELOAD OCCURS
U 1292, 0000,003C,0180,F800,0000,1293    ;2516          FS/MCT,MCT/ALLOW.IB.READ
U 1293, 0000,003C,69F0,2C00,0000,1294    ;2517          Q_ID[TIME.ADDR]          ; GET RESULTANT IPA FROM TIME OUT ADDRESS REG
U 1294, 0000,003C,0188,0800,0000,1295    ;2518          Q_Q.LEFT2,SI/ZERO        ; JUSTIFY ADDRESS IN Q PROPERLY
U 1295, 0000,003C,01A8,0800,0000,1296    ;2519          Q_Q.LEFT,SI/ZERO
U 1296, 0000,003C,01B0,0800,0000,1297    ;2520          Q_Q.RIGHT,SI/ZERO
U 1297, 0001,203C,0180,09E8,0000,1298    ;2521          RC[0D]_Q
U 1298, 0000,003C,4DF0,2C00,0000,1299    ;2522          Q_ID[TBER1]              ; GET TBER1 TO TEST AUTO RELOAD BIT
U 1299, 0001,203C,0180,09D8,0000,129A    ;2523          RC[0B]_Q
U 129A, 0800,003C,0180,0A28,0000,129B    ;2524          D_R[5]                   ; SEE IF IPA WAS CORRECT AFTER AUTO RELOAD
U 129B, 080D,0024,0180,0A00,0000,129C    ;2525          LAB_R[0],ALU_D[ANDNOT]LB,D_ALU
U 129C, 0001,003C,0180,09F0,0000,129D    ;2526          RC[0E]_D
U 129D, 0010,0038,01C0,0968,0000,129E    ;2527          Q_RC[0D]
U 129E, 001D,2000,0180,0800,0010,129F    ;2528          ALU_Q-D,CLK.UBCC
U 129F, 0000,013C,0180,0800,0000,1096    ;2529          Z?
U 1096, 0000,003D,0180,0800,0000,1182    ;2530   =0     ERROR1                   ; IPA INCORRECT AFTER AUTO RELOAD
U 1097, 0810,0038,0180,0958,0000,12A0    ;2531          D_RC[0B]                 : CHECK AUTO RELOAD BIT IN TBER1
U 12A0, 0819,0034,0580,0800,0000,12A1    ;2532          ALU_D[AND]K[.1],D_ALU
U 12A1, 0019,0000,0580,0800,0010,12A2    ;2533          ALU_D-K[.1],CLK.UBCC
U 12A2, 0000,013C,0180,0800,0000,1098    ;2534          Z?
U 1098, 0000,003D,0180,0800,0000,1182    ;2535   =0     ERROR1                   ; AUTO RELOAD BIT IN TBER1 INCORRECT
U 1099, 0000,003C,0180,0A10,0010,12A3    ;2536          ALU_R[2],CLK.UBCC        ; SEE IF ALL TEST PATTERN HAVE BEEN TRIED
U 12A3, 0000,013C,0180,0800,0000,109A    ;2537          Z?
U 109A, 0018,0000,0580,0A90,0000,108D    ;2538   =0     R[2]_LA-K[.1],J/AROA     ; IF NOT CONTINUE
U 109B, 0000,003C,0180,0800,0000,109C    ;2539          NOP
```

```
                                                .PAGE   "TEST F3        AUTO RELOAD TEST 2"
                                        ;*************************************************************
                                        ;++
                                        ; TEST  F3      AUTO RELOAD TEST 2
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS IS A TEST OF THE AUTO RELOAD FUNCTION WITH
                                        ;       THE VIBA BEING A HIT IN TB GROUP ZERO AND MME=1
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       LOGIC ON TBM AND DEP IS TESTED HERE
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       EXPECTED IPA
                                        ;       GOT IPA
                                        ;       EXPECTED TBER1
                                        ;       GOT TBER1
                                        ;       VIBA USED IN AUTO RELOAD
                                        ;       ERROR CODE :(FOR FAILCHAIN)
                                        ;               0=> FAILED WITH "ORIGINAL" ADDRESS PATTERN
                                        ;               1=> FAILED WITH COMPLEMENT ADDRESS PATTERN
                                        ;
                                        ;--
                                        ;*************************************************************
                                        =0
U 109C, 0000,003D,0180,0800,0000,116E   AR1:    NEWTST
U 109D, 1F18,0038,D580,09F8,0000,109E           D_0,IBC/STOP,RC[0F]_K[.6]       ; TURN IB OFF
U 109E, 0000,003D,4980,3C00,0000,1192   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI OFF
U 109F, 0818,0038,5980,0800,0000,12A4           D_K[.7F]                ; GENERATE ADDRESS WHICH WILL
U 12A4, 0100,003C,0180,0800,0000,12A5           D_D.LEFT2,SI/ZERO               ; CAUSE AUTO RELOAD WHEN LOADED
U 12A5, 0001,003C,0180,0A80,0000,10A0           R[0]_D                  ; R[0]=1FC
U 10A0, 081B,0001,0580,0800,0000,11ED   =0      ALU_0-K[.1],D_ALU,CALL,J/DC8 ; MASK TO GENERATE TEST DATA
U 10A1, 0600,003C,0180,0800,0000,12A6           D_D.RIGHT,SI/ZERO
U 12A6, 0001,003C,0180,0A88,0000,12A7           R[1]_D                  ; R[1]=7FFFFFFC
U 12A7, 0018,0038,8D80,0A90,0000,12A8           R[2]_K[.1F]             ; DATA PATTERN COUNTER
U 12A8, 0818,0038,0580,09E0,0000,10A2           RC[0C]_K[.1],D_K[.1]
U 10A2, 0000,003D,0180,0800,0000,11C3   =0      CALL,J/TBWPTP           ; GET TEST PATTERNS
U 10A3, 0818,0038,C180,0800,0000,12A9           D_K[.FFFF]
U 12A9, 0600,003C,0180,0800,0000,12AB           D_D.RIGHT,SI/ZERO
U 12AB, 0041,0028,0180,0AA0,0000,10A4           ALU_NOT.D,R[4]_ALU.RIGHT,SI/ZERO ; R[4]=7FFFC000
U 10A4, 0000,003D,0180,0800,0000,1181   =0      ERLOOP
U 10A5, 0F03,003C,0180,09C8,0000,12AC   AR1A:   D_0,RC[9]_0             ; TURN TB OFF
U 12AC, 0000,003C,4980,3C00,0000,12AD           ID[TBER0]_D
U 12AD, 0000,003C,0180,0A10,0082,12AE           SC_R[2]                 : VIBA
U 12AE, 0800,0034,0180,0A08,0000,12AF           ALU_R[1].AND.MASK,D_ALU
U 12AF, 0001,003C,0180,09D0,0000,12B0           RC[0A]_D
U 12B0, 0001,003C,0180,0AA8,0000,12B1           R[5]_D
U 12B1, 2019,0000,1180,0800,0000,12B2           ALU_D-K[.4],IBC/FLUSH   ; SET UP VIBA
U 12B2, 0000,003C,0180,0A00,0200,12B3           VA_R[0]                 ; SET VA=1FC
U 12B3, 0000,003C,0180,9000,0000,10A6           FS/MCT,MCT/INVALIDATE   ; INVALIDATE LOCATION 1FC IN BOTH GROUPS
U 10A6, 0000,003D,0180,0800,0000,121E   =0      CALL,J/ROS              ; SET FORCE REPLACE GROUP 0 BIT
U 10A7, 0F00,003C,0180,0800,0000,12B4           D_0                     ; WRITE DATA=00000000 INTO LOCATION 1FC
U 12B4, 0000,003C,0180,9800,0000,12B5           FS/MCT,MCT/VALIDATE     ; OF GROUP 0
U 12B5, 0000,003C,0180,6000,0000,12B6           FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
U 12B6, 0000,003C,0180,0A28,0200,12B7           VA_R[5]                 ; MAKE VIBA A HIT IN BOTH TB GROUPS
```

```
U 12B7, 0000,003C,0180,0900,0000,10A8   ;2595           LC_RC[0]
U 10A8, 0010,0039,0180,0AC0,0000,1014   ;2596   =0      R[8]_LC,CALL,J/TBWRB
U 10A9, 0800,003C,0180,0A28,0000,12B8   ;2597           D_R[5]                    ; MAKE VIBA A MISS IN TB GROUP 1
U 12B8, 000D,0020,0180,0A20,0200,12B9   ;2598           LAB_R[4],ALU_D[XOR]LB,VA_ALU
U 12B9, 0000,003C,0180,0918,0000,10AA   ;2599           LC_RC[3]
U 10AA, 0010,0039,0180,0AC0,0000,100C   ;2600   =0      R[8]_LC,CALL,J/TBWR1
U 10AB, 0018,0038,1980,0800,0200,12BA   ;2601           VA_K[ZERO]                ; CLEAR VA
U 12BA, 3000,003C,0180,0800,0000,12BB   ;2602           IBC/START                 ; START IB REFERENCES
U 12BB, 0000,003C,0180,F800,0000,12BC   ;2603           FS/MCT,MCT/ALLOW.IB.READ  ; LET IB DO 1 READ WHICH
U 12BC, 0000,003C,0180,F800,0000,12BD   ;2604           FS/MCT,MCT/ALLOW.IB.READ  ; WILL CAUSE INCREMENT IPA AND
U 12BD, 1000,003C,0180,F800,0000,12BE   ;2605           IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; AUTO RELOAD
U 12BE, 0000,003C,0180,F800,0000,12BF   ;2606           FS/MCT,MCT/ALLOW.IB.READ
U 12BF, 0000,003C,69F0,2C00,0000,12C0   ;2607           Q_ID[TIME.ADDR]           ; GET NEW IPA FROM TIME OUT ADDRESS REG
U 12C0, 0000,003C,0188,0800,0000,12C1   ;2608           Q_Q.LEFT2,SI/ZERO         ; JUSTIFY ADDRESS IN Q PROPERLY
U 12C1, 0000,003C,01A8,0800,0000,12C2   ;2609           Q_Q.LEFT,SI/ZERO
U 12C2, 0000,003C,01B0,0800,0000,12C3   ;2610           Q_Q.RIGHT,SI/ZERO
U 12C3, 0001,203C,0180,09E8,0000,12C4   ;2611           RC[0D]_Q
U 12C4, 0000,003C,4DF0,2C00,0000,12C5   ;2612           Q_ID[TBER1]               ; GET TBER1 TO CHECK AUTO RELOAD BIT
U 12C5, 0001,203C,0180,09D8,0000,12C6   ;2613           RC[0B]_Q
U 12C6, 0810,0038,0180,0910,0000,12C7   ;2614           D_RC[2]                   ; SEE IF VIBA WAS RELOCATED
U 12C7, 0100,003C,0180,0800,0000,12C8   ;2615           D_D.LEFT2,SI/ZERO         ; PROPERLY THRU TB GROUP 0
U 12C8, 0001,003C,0180,09F0,0000,12C9   ;2616           RC[0E]_D                  ; WHEN THE AUTO RELOAD OCCURRED
U 12C9, 0010,0038,01C0,0968,0000,12CA   ;2617           Q_RC[0D]
U 12CA, 001D,2000,0180,0800,0010,12CB   ;2618           ALU_Q-D,CLK.UBCC
U 12CB, 0000,013C,0180,0800,0000,10AC   ;2619           Z?
U 10AC, 0000,003D,0180,0800,0000,1182   ;2620   =0      ERROR1                    ; IPA INCORRECT AFTER AUTO RELOADED
                                        ;2621                           ; FROM TB GROUP 0
U 10AD, 0810,0038,0180,0958,0000,12CC   ;2622           D_RC[0B]                  ; CHECK THE AUTO RELOAD
U 12CC, 0819,0034,0580,0800,0000,12CD   ;2623           ALU_D[AND]K[.1],D_ALU     ; BIT IN TBER1
U 12CD, 0019,0000,0580,0800,0010,12CE   ;2624           ALU_D-K[.1],CLK.UBCC
U 12CE, 0000,013C,0180,0800,0000,10AE   ;2625           Z?
U 10AE, 0000,003D,0180,0800,0000,1182   ;2626   =0      ERROR1                    ; TBER1 AUTO RELOAD BIT NOT SET
U 10AF, 0F18,0038,0580,09C8,0000,12CF   ;2627           D_0,RC[9]_K[.1]           ; NOW USE COMPLEMENT TEST PATTERN
U 12CF, 0000,003C,4980,3C00,0000,12D0   ;2628           ID[TBER0]_D               ; TURN OFF TB
U 12D0, 0000,003C,0180,0A10,0082,12D1   ;2629           SC_R[2]                   ; GENERATE VIBA VALUE
U 12D1, 0800,0024,0180,0A08,0000,12D2   ;2630           ALU_R[1].ANDNOT.MASK,D_ALU
U 12D2, 0001,003C,0180,09D0,0000,12D3   ;2631           RC[0A]_D
U 12D3, 0001,003C,0180,0AA8,0000,12D4   ;2632           R[5]_D
U 12D4, 2019,0000,1180,0800,0000,12D5   ;2633           ALU_D-K[.4],IBC/FLUSH     ; LOAD TEST PATTERN INTO VIBA
U 12D5, 0000,003C,0180,0A00,0200,12D6   ;2634           VA_R[0]                   ; LOAD VA=1FC
U 12D6, 0000,003C,0180,9000,0000,10B0   ;2635           FS/MCT,MCT/INVALIDATE     ; INVALIDATE LOCATION 1FC IN BOTH GROUPS
U 10B0, 0000,003D,0180,0800,0000,121E   ;2636   =0      CALL,J/ROS                ; SET FORCE REPLACE GROUP 0 BIT
U 10B1, 0F00,003C,0180,0800,0000,12D7   ;2637           D_0                       ; WRITE DATA=00000000 INTO LOCATION
U 12D7, 0000,003C,0180,9800,0000,12D8   ;2638           FS/MCT,MCT/VALIDATE       ; 1FC OF GROUP 0
U 12D8, 0000,003C,0180,6000,0000,12D9   ;2639           FS/MCT,MCT/READ.V.NEWPC   ; LOAD 1FC INTO IPA
U 12D9, 0000,003C,0180,0A28,0200,12DA   ;2640           VA_R[5]         ; MAKE VIBA A HIT IN BOTH TB GROUPS
U 12DA, 0000,003C,0180,0918,0000,10B2   ;2641           LC_RC[3]
U 10B2, 0010,0039,0180,0AC0,0000,1014   ;2642   =0      R[8]_LC,CALL,J/TBWRB
U 10B3, 0800,003C,0180,0A28,0000,12DB   ;2643           D_R[5]                    ; MAKE VIBA A MISS IN TB GROUP 1
U 12DB, 000D,0020,0180,0A20,0200,12DC   ;2644           LAB_R[4],ALU_D[XOR]LB,VA_ALU
U 12DC, 0000,003C,0180,0900,0000,10B4   ;2645           LC_RC[0]
U 10B4, 0010,0039,0180,0AC0,0000,100C   ;2646   =0      R[8]_LC,CALL,J/TBWR1
U 10B5, 0018,0038,1980,0800,0200,12DD   ;2647           VA_K[ZERO]                ; CLEAR VA
U 12DD, 3000,003C,0180,0800,0000,12DE   ;2648           IBC/START                 ; START IB REFERENCES
U 12DE, 0000,003C,0180,F800,0000,12DF   ;2649           FS/MCT,MCT/ALLOW.IB.READ  ; LET IB DO 1 READ WHICH WILL
```

```
U 12DF, 0000,003C,0180,F800,0000,12E0    ;2650          FS/MCT,MCT/ALLOW.IB.READ ; CAUSE THE IPA TO BE INCREMENTED AND
U 12E0, 1000,003C,0180,F800,0000,12E1    ;2651          IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; AUTO RELOADED
U 12E1, 0000,003C,0180,F800,0000,12E2    ;2652          FS/MCT,MCT/ALLOW.IB.READ
U 12E2, 0000,003C,69F0,2C00,0000,12E3    ;2653          Q_ID[TIME.ADDR]           ; GET AUTO RELOADED IPA
U 12E3, 0000,003C,0188,0800,0000,12E4    ;2654          Q_Q.LEFT2,SI/ZERO         ; JUSTIFY ADDRESS IN Q PROPERLY
U 12E4, 0000,003C,01A8,0800,0000,12E5    ;2655          Q_Q.LEFT,SI/ZERO
U 12E5, 0000,003C,01B0,0800,0000,12E6    ;2656          Q_Q.RIGHT,SI/ZERO
U 12E6, 0001,203C,0180,09E8,0000,12E7    ;2657          RC[0D]_Q
U 12E7, 0000,003C,4DF0,2C00,0000,12E8    ;2658          Q_ID[TBER1]               ; GET TBER1 TO CHECK
U 12E8, 0001,203C,0180,09D8,0000,12E9    ;2659          RC[0B]_Q                  ; AUTO RELOAD BIT
U 12E9, 0810,0038,0180,0928,0000,12EA    ;2660          D_RC[5]                   ; CHECK IPA AUTO RELOADED ADDRESS
U 12EA, 0100,003C,0180,0800,0000,12EB    ;2661          D_D.LEFT2,SI/ZERO
U 12EB, 0001,003C,0180,09F0,0000,12EC    ;2662          RC[0E]_D
U 12EC, 0010,0038,01C0,0968,0000,12ED    ;2663          Q_RC[0D]
U 12ED, 001D,2000,0180,0800,0010,12EE    ;2664          ALU_Q-D,CLK.UBCC
U 12EE, 0000,013C,0180,0800,0000,10B6    ;2665          Z?
U 10B6, 0000,003D,0180,0800,0000,1182    ;2666   =0     ERROR1                    ; IPA INCORRECT AFTER AUTO RELOAED
                                         ;2667                                    ; FROM GROUP 0
U 10B7, 0810,0038,0180,0958,0000,12EF    ;2668          D_RC[0B]                  ; CHECK AUTO RELOAD BIT IN TBER1
U 12EF, 0819,0034,0580,0800,0000,12F0    ;2669          ALU_D[AND]K[.1],D_ALU
U 12F0, 0019,0000,0580,0800,0010,12F1    ;2670          ALU_D-K[.1],CLK.UBCC
U 12F1, 0000,013C,0180,0800,0000,10B8    ;2671          Z?
U 10B8, 0000,003D,0180,0800,0000,1182    ;2672   =0     ERROR1                    ; AUTO RELOAD BIT NOT SET IN TBER1
U 10B9, 0000,003C,0180,0A10,0010,12F2    ;2673          ALU_R[2],CLK.UBCC         ; HAVE ALL TEST PATTERNS BEEN TRIED?
U 12F2, 0000,013C,0180,0800,0000,10BA    ;2674          Z?
U 10BA, 0018,0000,0580,0A90,0000,10A5    ;2675   =0     R[2]_LA-K[.1],J/AR1A      ; IF NOT CONTINUE
U 10BB, 0000,003C,0180,0800,0000,10BC    ;2676          NOP
```

```
                                         ;2677          .PAGE   "TEST F4        AUTO RELOAD TEST 3"
                                         ;2678   ;*****************************************************************
                                         ;2679   ;++
                                         ;2680   ; TEST  F4      AUTO RELOAD TEST 3
                                         ;2681   ;
                                         ;2682   ; TEST DESCRIPTION
                                         ;2683   ;       THIS IS A TEST OF THE AUTO RELOAD FUNCTION WITH
                                         ;2684   ;       THE VIBA BEING A HIT IN TB GROUP ONE AND MME=1
                                         ;2685   ;
                                         ;2686   ; LOGIC DESCRIPTION
                                         ;2687   ;       LOGIC ON TBM IS TESTED HERE
                                         ;2688   ;
                                         ;2689   ; ERROR DESCRIPTION
                                         ;2690   ;       EXPECTED IPA
                                         ;2691   ;       GOT IPA
                                         ;2692   ;       EXPECTED TBER1
                                         ;2693   ;       GOT TBER1
                                         ;2694   ;       VIBA USED IN AUTO RELOAD
                                         ;2695   ;
                                         ;2696   ;--
                                         ;2697   ;*****************************************************************
                                         ;2698   =0
U 10BC, 0000,003D,0180,0800,0000,116E    ;2699   AR2:    NEWTST
U 10BD, 1F00,003C,0180,0800,0000,10BE    ;2700           D_0,IBC/STOP            ; TURN IB OFF
U 10BE, 0000,003D,4980,3C00,0000,1192    ;2701   =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 10BF, 0818,0038,5980,0800,0000,12F3    ;2702           D_K[.7F]
U 12F3, 0100,003C,0180,0800,0000,12F4    ;2703           D_D.LEFT2,SI/ZERO
U 12F4, 0001,003C,0180,0A80,0000,10C0    ;2704           R[0]_D                  ; R[0]=1FC
U 10C0, 081B,0001,0580,0800,0000,11ED    ;2705   =0      ALU_0-K[.1],D_ALU,CALL,J/DC8
U 10C1, 0600,003C,0180,0800,0000,12F5    ;2706           D_D.RIGHT,SI/ZERO
U 12F5, 0001,003C,0180,0A88,0000,12F6    ;2707           R[1]_D                  ; R[1]=7FFFFFFC
U 12F6, 0018,0038,8D80,0A90,0000,12F7    ;2708           R[2]_K[.1F]             ; TEST PATTERN COUNTER
U 12F7, 0818,0038,0580,09E0,0000,12F8    ;2709           RC[0C]_K[.1],D_K[.1]
U 12F8, 0019,0014,1180,09F8,0000,10C2    ;2710           RC[0F]_ALU,ALU_D+K[.4]
U 10C2, 0000,003D,0180,0800,0000,11C3    ;2711   =0      CALL,J7TBWPTP           ; GET TEST PATTERNS
U 10C3, 0818,0038,C180,0800,0000,12F9    ;2712           D_K[.FFFF]
U 12F9, 0600,003C,0180,0800,0000,12FA    ;2713           D_D.RIGHT,SI/ZERO
U 12FA, 0041,0028,0180,0AA0,0000,10C4    ;2714           A[U_NOT.D,R[4]_ALU.RIGHT,SI/ZERO ; R[4]=7FFFC000
U 10C4, 0000,003D,0180,0800,0000,1181    ;2715   =0      ERLOOP
U 10C5, 0F00,003C,0180,0800,0000,12FB    ;2716   AR2A:   D_0                     ; TURN OF TB
U 12FB, 0000,003C,4980,3C00,0000,12FC    ;2717           ID[TBER0]_D
U 12FC, 0000,003C,0180,0A10,0082,12FD    ;2718           SC_R[2]
U 12FD, 0800,0034,0180,0A08,0000,12FE    ;2719           ALU_R[1].AND.MASK,D_ALU ; GENERATE DATA FOR VIBA
U 12FE, 0001,003C,0180,09D0,0000,12FF    ;2720           RC[0A]_D
U 12FF, 0001,003C,0180,0AA8,0000,1300    ;2721           R[5]_D
U 1300, 2019,0000,1180,0800,0000,1301    ;2722           ALU_0-K[.4],IBC/FLUSH   ; LOAD VIBA
U 1301, 0000,003C,0180,0A00,0200,1302    ;2723           VA_R[0]                 ; LOAD VA=1FC
U 1302, 0000,003C,0180,9000,0000,10C6    ;2724           FS7MCT,MCT/INVALIDATE   ; INVALIDATE 1FC IN BOTH CACHE GROUPS
U 10C6, 0000,003D,0180,0800,0000,121E    ;2725   =0      CALL,J/ROS              ; SET FORCE REPLACE GROUP 0 BIT IN CACHE
U 10C7, 0F00,003C,0180,0800,0000,1303    ;2726           D_0                     ; WRITE DATA=0 INTO LOCATION 1FC
U 1303, 0000,003C,0180,9800,0000,1304    ;2727           FS/MCT,MCT/VALIDATE     ; OF CACHE GROUP 0
U 1304, 0000,003C,0180,6000,0000,1305    ;2728           FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
U 1305, 0000,003C,0180,0A28,0200,1306    ;2729           VA_R[5]                 ; MAKE VIBA A HIT IN BOTH TB GROUPS
U 1306, 0000,003C,0180,0900,0000,10C8    ;2730           LC_RC[0]
U 10C8, 0010,0039,0180,0AC0,0000,1014    ;2731   =0      R[8]_LC,CALL,J/TBWRB
```

```
U 10C9, 0800,003C,0180,0A28,0000,1307    ;2732            D_R[5]                    ; MAKE VIBA A MISS IN GROUP 0
U 1307, 000D,0020,0180,0A20,0200,1308    ;2733            LAB_R[4],ALU_D[XOR]LB,VA_ALU
U 1308, 0000,003C,0180,0918,0000,10CA    ;2734            LC_RC[3]
U 10CA, 0010,0039,0180,0AC0,0000,1012    ;2735     =0     R[8]_LC,CALL,J/TBWR0
U 10CB, 0018,0038,1980,0800,0200,1309    ;2736            VA_K[ZERO]                ; CLEAR VA
U 1309, 3000,003C,0180,0800,0000,130A    ;2737            IBC/START                 ; START IB REFERENCES
U 130A, 0000,003C,0180,F800,0000,130B    ;2738            FS/MCT,MCT/ALLOW.IB.READ  ; LET IB DO 1 READ WHICH WILL INCREMENT
U 130B, 0000,003C,0180,F800,0000,130C    ;2739            FS/MCT,MCT/ALLOW.IB.READ  ; THE IPA CAUSING AUTO RELOAD
U 130C, 1000,003C,0180,F800,0000,130D    ;2740            IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ
U 130D, 0000,003C,0180,F800,0000,130E    ;2741            FS/MCT,MCT/ALLOW.IB.READ
U 130E, 0000,003C,69F0,2C00,0000,130F    ;2742            Q_ID[TIME.ADDR]           ; GET AUTO RELOADED IPA
U 130F, 0000,003C,0188,0800,0000,1310    ;2743            Q_Q.LEFT2,SI/ZERO         ; JUSTIFY ADDRESS IN Q PROPERLY
U 1310, 0000,003C,01A8,0800,0000,1311    ;2744            Q_Q.LEFT,SI/ZERO
U 1311, 0000,003C,01B0,0800,0000,1312    ;2745            Q_Q.RIGHT,SI/ZERO
U 1312, 0001,203C,0180,09E8,0000,1313    ;2746            RC[0D]_Q
U 1313, 0000,003C,4DF0,2C00,0000,1314    ;2747            Q_ID[TBER1]               ; GET TBER1 TO TEST AUTO RELOAD BIT
U 1314, 0001,203C,0180,09D8,0000,1315    ;2748            RC[0B]_Q
U 1315, 0810,0038,0180,0910,0000,1316    ;2749            D_RC[2]                   ; CHECK THE RELOADED IPA
U 1316, 0100,003C,0180,0800,0000,1317    ;2750            D_D.LEFT2,SI/ZERO
U 1317, 0001,003C,0180,09F0,0000,1318    ;2751            RC[0E]_D
U 1318, 0010,0038,01C0,0968,0000,1319    ;2752            Q_RC[0D]
U 1319, 001D,2000,0180,0800,0010,131A    ;2753            ALU_Q-D,CLK.UBCC
U 131A, 0000,013C,0180,0800,0000,10CC    ;2754            Z?
U 10CC, 0000,003D,0180,0800,0000,1182    ;2755     =0     ERROR1                    ; THE IPA RELOADED FROM GROUP 1 WAS INCORRECT.
U 10CD, 0810,0038,0180,0958,0000,131B    ;2756            D_RC[0B]                  ; CHECK THE AUTO RELOAD BIT
U 131B, 0819,0034,0580,0800,0000,131C    ;2757            ALU_D[AND]K[.1],D_ALU     ; IN TBER1
U 131C, 0019,0000,0580,0800,0010,131D    ;2758            ALU_D-K[.1],CLK.UBCC
U 131D, 0000,013C,0180,0800,0000,10CE    ;2759            Z?
U 10CE, 0000,003D,0180,0800,0000,1182    ;2760     =0     ERROR1                    ; THE AUTO RELOAD BIT IN TBER1 WAS CLEAR
U 10CF, 0F00,003C,0180,0800,0000,131E    ;2761            D_0                       ; TURN OF THE TB
U 131E, 0000,003C,4980,3C00,0000,131F    ;2762            ID[TBER0]_D
U 131F, 0000,003C,0180,0A10,0082,1320    ;2763            SC_R[2]                   ; RUN TEST WITH COMPLEMENT DATA PATTERN
U 1320, 0800,0024,0180,0A08,0000,1321    ;2764            ALU_R[1].ANDNOT.MASK,D_ALU ; COMPUTE VIBA
U 1321, 0001,003C,0180,09D0,0000,1322    ;2765            RC[0A]_D
U 1322, 0001,003C,0180,0AA8,0000,1323    ;2766            R[5]_D
U 1323, 2019,0000,1180,0800,0000,1324    ;2767            ALU_D-K[.4],IBC/FLUSH     ; LOAD VIBA
U 1324, 0000,003C,0180,0A00,0200,1325    ;2768            VA_R[0]                   ; LOAD VA=1FC
U 1325, 0000,003C,0180,9000,0000,10D0    ;2769            FS7MCT,MCT/INVALIDATE     ; INVALIDATE LOCATION 1FC IN BOTH CACHE GROUPS
U 10D0, 0000,003D,0180,0800,0000,121E    ;2770     =0     CALL,J/ROS                ; SET FORCE REPLACE GROUP 0 BIT
U 10D1, 0F00,003C,0180,0800,0000,1326    ;2771            D_0                       ; WRITE DATA=0 INTO LOCATION 1FC
U 1326, 0000,003C,0180,9800,0000,1327    ;2772            FS/MCT,MCT/VALIDATE       ; OF CACHE GROUP 0
U 1327, 0000,003C,0180,6000,0000,1328    ;2773            FS/MCT,MCT/READ.V.NEWPC   ; LOAD 1FC INTO IPA
U 1328, 0000,003C,0180,0A28,0200,1329    ;2774            VA_R[5]                   ; MAKE VIBA A HIT IN BOTH
U 1329, 0000,003C,0180,0918,0000,10D2    ;2775            LC_RC[3]                  : GROUPS OF THE TB
U 10D2, 0010,0039,0180,0AC0,0000,1014    ;2776     =0     R[8]_LC,CALL,J/TBWRB
U 10D3, 0800,003C,0180,0A28,0000,132A    ;2777            D_R[5]                    ; MAKE VIBA A MISS TO TB GROUP 0
U 132A, 0000,003C,0180,0A20,0000,132B    ;2778            LAB_R[4]
U 132B, 000D,0020,0180,0800,0200,132C    ;2779            ALU_D[XOR]LB,VA_ALU
U 132C, 0000,003C,0180,0900,0000,10D4    ;2780            LC_RC[0]
U 10D4, 0010,0039,0180,0AC0,0000,100C    ;2781     =0     R[8]_LC,CALL,J/TBWR1
U 10D5, 0018,0038,1980,0800,0200,132D    ;2782            VA_K[ZERO]                ; CLEAR THE VA
U 132D, 3000,003C,0180,0800,0000,132E    ;2783            IBC/START                 ; START IB REFERENCES
U 132E, 0000,003C,0180,F800,0000,132F    ;2784            FS/MCT,MCT/ALLOW.IB.READ  ; LET THE IB MAKE 1 REFERENCE SO
U 132F, 0000,003C,0180,F800,0000,1330    ;2785            FS/MCT,MCT/ALLOW.IB.READ  ; THE IPA GETS INCREMENTED AND RELOADED
U 1330, 1000,003C,0180,F800,0000,1331    ;2786            IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ
```

```
U 1331, 0000,003C,0180,F800,0000,1332   ;2787          FS/MCT,MCT/ALLOW.IB.READ
U 1332, 0000,003C,69F0,2C00,0000,1333   ;2788          Q_ID[TIME.ADDR]          ; GET RELOADED IPA
U 1333, 0000,003C,0188,0800,0000,1334   ;2789          Q_Q.LEFT2,SI/ZERO        ; JUSTIFY ADDRESS IN Q PROPERLY
U 1334, 0000,003C,01A8,0800,0000,1335   ;2790          Q_Q.LEFT,SI/ZERO
U 1335, 0000,003C,01B0,0800,0000,1336   ;2791          Q_Q.RIGHT,SI/ZERO
U 1336, 0001,203C,0180,09E8,0000,1337   ;2792          RC[0D]_Q
U 1337, 0000,003C,4DF0,2C00,0000,1338   ;2793          Q_ID[TBER1]              ; GET TBER1 TO CHECK THE
U 1338, 0001,203C,0180,09D8,0000,1339   ;2794          RC[0B]_Q                 ; AUTO RELOAD BIT
U 1339, 0810,0038,0180,0928,0000,133A   ;2795          D_RC[5]                  ; CHECK THE IPA WHICH
U 133A, 0100,003C,0180,0800,0000,133B   ;2796          D_D.LEFT2,SI/ZERO        ; WAS RELOADED FROM TB GROUP 1
U 133B, 0001,003C,0180,09F0,0000,133C   ;2797          RC[0E]_D
U 133C, 0010,0038,01C0,0968,0000,133D   ;2798          Q_RC[0D]
U 133D, 001D,2000,0180,0800,0010,133E   ;2799          ALU_Q-D,CLK.UBCC
U 133E, 0000,013C,0180,0800,0000,10D6   ;2800          Z?
U 10D6, 0000,003D,0180,0800,0000,1182   ;2801    =0    ERROR1                   ; IPA INCORRECT AFTER BEING
                                        ;2802                        ; RELOADED FROM GROUP 1
U 10D7, 0810,0038,0180,0958,0000,133F   ;2803          D_RC[0B]                 ; CHECK THE AUTO RELOAD
U 133F, 0819,0034,0580,0800,0000,1340   ;2804          ALU_D[AND]K[.1],D_ALU    ; BIT IN TBER1
U 1340, 0019,0000,0580,0800,0010,1341   ;2805          ALU_D-K[.1],CLK.UBCC
U 1341, 0000,013C,0180,0800,0000,10D8   ;2806          Z?
U 10D8, 0000,003D,0180,0800,0000,1182   ;2807    =0    ERROR1                   ; THE AUTO RELOAD BIT IN TBER1 WAS CLEAR
U 10D9, 0000,003C,0180,0A10,0010,1342   ;2808          ALU_R[2],CLK.UBCC        ; HAVE ALL DATA PATTERNS BEEN TESTED?
U 1342, 0000,013C,0180,0800,0000,10DA   ;2809          Z?
U 10DA, 0018,0000,0580,0A90,0000,10C5   ;2810    =0    R[2]_LA-K[.1],J/AR2A     ; IF NOT CONTINUE
U 10DB, 0000,003C,0180,0800,0000,10DC   ;2811          NOP
```

```
                                                  .PAGE   "TEST F5       AUTO RELOAD TEST 4"
                                          ;****************************************************************
                                          ;++
                                          ; TEST  F5      AUTO RELOAD TEST 4
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS IS A TEST OF THE AUTO RELOAD FUNCTION WITH
                                          ;       PTE WRITTEN AT VA=4CCCC000 IN TB GROUP 0
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;       LOGIC ON TBM IS TESTED HERE
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       EXPECTED IPA
                                          ;       GOT IPA
                                          ;       EXPECTED TBER1
                                          ;       GOT TBER1
                                          ;       PTE WRITTEN AT VA=4CCCC000 IN TB GROUP 0
                                          ;
                                          ;--
                                          ;****************************************************************
                                          =0
U 10DC, 0000,003D,0180,0800,0000,116E     AR3:    NEWTST
U 10DD, 1F00,003C,0180,0800,0000,10DE             D_0,IBC/STOP            ; TURN IB OFF
U 10DE, 0000,003D,4980,3C00,0000,1192     =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 10DF, 0818,0038,5980,0800,0000,1343             D_K[.7F]
U 1343, 0100,003C,0180,0800,0000,1344             D_D.LEFT2,SI/ZERO
U 1344, 0001,003C,0180,0A80,0000,10E0             R[0]_D                  ; R[0]=1FC
U 10E0, 081B,0001,0580,0800,0000,11E5     =0      ALU_D-K[.1],D_ALU,CALL,J/DC0
U 10E1, 0200,003C,0180,0800,0000,1345             D_D.RIGHT2,SI7ZERO
U 1345, 0001,003C,0180,0A88,0000,1346             R[1]_D                  ; R[1]=3FFFFFFC
U 1346, 0018,0038,2180,0A90,0000,1347             R[2]_K[.14]
U 1347, 0818,0038,0580,09E0,0000,1348             RC[0C]_K[.1],D_K[.1]
U 1348, 0019,0014,1180,09F8,0000,10E2             ALU_D+K[.4],RC[0F]_ALU
U 10E2, 0000,003D,0180,0800,0000,11C3     =0      CAL[,J/TBWPTP           ; GET SOME TEST PATTERNS
U 10E3, 0000,003C,0180,0800,0000,10E4             NOP
U 10E4, 0000,003D,0180,0800,0000,1181     =0      ERLOOP
U 10E5, 0F00,003C,0180,0800,0000,1349     AR3A:   D_0                     ; TURN TB OFF
U 1349, 0000,003C,4980,3C00,0000,134A             ID[TBER0]_D
U 134A, 0810,0038,0180,0908,0000,134B             D_RC[1]                 ; LOAD 4CCCC000-4 INTO VIBA
U 134B, 2019,0000,1180,0AA8,0000,134C             A[U_D-K[.4],R[5]_ALU,IBC/FLUSH
U 134C, 0000,003C,0180,0A00,0200,134D             VA_R[0]                 ; LOAD 1FC INTO THE VA
U 134D, 0000,003C,0180,9000,0000,10E6             FS7MCT,MCT/INVALIDATE   ; INVALIDATE LOCATION 1FC IN CACHE
U 10E6, 0000,003D,0180,0800,0000,121E     =0      CALL,J/ROS              ; SET FORCE REPLACE GROUP 0 IN CACHE
U 10E7, 0F00,003C,0180,0800,0000,134E             D_0                     ; WRITE DATA=0 INTO LOCATION 0 OF CACHE
U 134E, 0000,003C,0180,9800,0000,134F             FS/MCT,MCT/VALIDATE
U 134F, 0000,003C,0180,6000,0000,1350             FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
U 1350, 0010,0038,0180,0908,0200,1351             VA_RC[1]                ; MAKE 4CCCC000 A HIT IN BOTH
U 1351, 0010,0038,0180,0AA8,0000,1352             R[5]_LC                 ; GROUPS OF THE TB WITH PTE
U 1352, 0000,003C,0180,0A10,0082,1353             SC_R[2]                 ; BEING THE TEST DATA PATTERN
U 1353, 0800,0034,0180,0A68,0000,1354             ALU_R[0D].AND.MASK,D_ALU
U 1354, 080D,0030,0180,0A60,0000,1355             LAB_R[0C],ALU_D[OR]LB,D_ALU
U 1355, 0001,003C,0180,09D0,0000,10E8             RC[0A]_D
U 10E8, 0001,003D,0180,0AB0,0000,1016     =0      R[6]_D,CALL,J/RELSUB
U 10E9, 0000,003C,01C0,0A30,0000,10EA             Q_R[6]
```

```
U 10EA, 0001,203D,0180,0AC0,0000,1014     ;2867    =0      R[8]_Q,CALL,J/TBWRB
U 10EB, 0010,0038,0180,0920,0200,1356     ;2868            VA_RC[4]                   ; MAKE ADDRESS=55554000 A HIT IN
U 1356, 0810,0038,0180,0918,0000,10EC     ;2869            D_RC[3]                    ; TB GROUP 1 WITH PTE=A4155555
U 10EC, 0001,003D,0180,0AC0,0000,100C     ;2870    =0      R[8]_D,CALL,J/TBWR1
U 10ED, 0018,0038,1980,0800,0200,1357     ;2871            VA_K[ZERO]                 ; CLEAR THE VA
U 1357, 3000,003C,0180,0800,0000,1358     ;2872            IBC/START                  ; START IB REFERENCES
U 1358, 0000,003C,0180,F800,0000,1359     ;2873            FS/MCT,MCT/ALLOW.IB.READ ; LET IB DO 1 REFERENCE SO THAT THE
U 1359, 0000,003C,0180,F800,0000,135A     ;2874            FS/MCT,MCT/ALLOW.IB.READ ; IPA IS INCREMENTED AND
U 135A, 1000,003C,0180,F800,0000,135B     ;2875            IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; RELOADED
U 135B, 0000,003C,0180,F800,0000,135C     ;2876            FS/MCT,MCT/ALLOW.IB.READ
U 135C, 0000,003C,69F0,2C00,0000,135D     ;2877            Q_ID[TIME.ADDR]            ; GET RELOADED IPA
U 135D, 0000,003C,0188,0800,0000,135E     ;2878            Q_Q.LEFT2,SI/ZERO          ; JUSTIFY ADDRESS IN Q PROPERLY
U 135E, 0000,003C,01A8,0800,0000,135F     ;2879            Q_Q.LEFT,SI/ZERO
U 135F, 0000,003C,01B0,0800,0000,1360     ;2880            Q_Q.RIGHT,SI/ZERO
U 1360, 0001,203C,0180,09E8,0000,1361     ;2881            RC[0D]_Q
U 1361, 0000,003C,4DF0,2C00,0000,1362     ;2882            Q_ID[TBER1]                ; GET TBER1 SO THAT THE AUTO RELOAD
U 1362, 0001,203C,0180,09D8,0000,1363     ;2883            RC[0B]_Q                   ; BIT CAN BE CHECKED
U 1363, 0800,003C,0180,0A38,0000,1364     ;2884            D_R[7]                     ; CHECK THE AUTO RELOADED
U 1364, 0100,003C,0180,0800,0000,1365     ;2885            D_D.LEFT2,SI/ZERO          ; IPA WHICH WAS RELOCATED
U 1365, 0001,003C,0180,09F0,0000,1366     ;2886            RC[0E]_D                   ; FROM GROUP 0 OF THE TB
U 1366, 0010,0038,01C0,0968,0000,1367     ;2887            Q_RC[0D]
U 1367, 001D,2000,0180,0800,0010,1368     ;2888            ALU_Q-D,CLK.UBCC
U 1368, 0000,013C,0180,0800,0000,10EE     ;2889            Z?
U 10EE, 0000,003D,0180,0800,0000,1182     ;2890    =0      ERROR1                     ; IPA RELOADED INCORRECTLY
                                          ;2891                                       ; FROM TB GROUP 0
U 10EF, 0810,0038,0180,0958,0000,1369     ;2892            D_RC[0B]                   ; CHECK THE AUTO RELOAD BIT IN TBER1
U 1369, 0819,0034,0580,0800,0000,136A     ;2893            ALU_D[AND]K[.1],D_ALU
U 136A, 0019,0000,0580,0800,0010,136B     ;2894            ALU_D-K[.1],CLK.UBCC
U 136B, 0000,013C,0180,0800,0000,10F0     ;2895            Z?
U 10F0, 0000,003D,0180,0800,0000,1182     ;2896    =0      ERROR1                     ; AUTO RELOAD BIT IN TBER1 NOT SET
U 10F1, 0F00,003C,0180,0800,0000,136C     ;2897            D_0                        ; TURN OFF TB
U 136C, 0000,003C,4980,3C00,0000,136D     ;2898            ID[TBER0]_D
U 136D, 0810,0038,0180,0920,0000,136E     ;2899            D_RC[4]                    ; LOAD 55554000-4 INTO VIBA
U 136E, 2019,0000,1180,0AA8,0000,136F     ;2900            ALU_D-K[.4],R[5]_ALU,IBC/FLUSH
U 136F, 0000,003C,0180,0A00,0200,1370     ;2901            VA_R[0]                    ; LOAD 1FC INTO THE VA
U 1370, 0000,003C,0180,9000,0000,10F2     ;2902            FS7MCT,MCT/INVALIDATE      ; INVALIDATE 1FC IN CACHE
U 10F2, 0000,003D,0180,0800,0000,121E     ;2903    =0      CALL,J/ROS                 ; SET FORCE REPLACE GROUP 0 BIT IN CACHE
U 10F3, 0F00,003C,0180,0800,0000,1371     ;2904            D_0                        ; WTITE DATA=0 INTO 1FC OF GROUP 0
U 1371, 0000,003C,0180,9800,0000,1372     ;2905            FS/MCT,MCT/VALIDATE
U 1372, 0000,003C,0180,6000,0000,1373     ;2906            FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
U 1373, 0010,0038,0180,0920,0200,1374     ;2907            VA_RC[4]                   ; WRITE VA=55554000 WITH PTE
U 1374, 0010,0038,0180,0AA8,0000,1375     ;2908            R[5]_LC                    ; BEING THE TEST PATTERN INTO
U 1375, 0000,003C,0180,0A10,0082,1376     ;2909            SC_R[2]                    ; TB GROUP 0 AND 1
U 1376, 0800,001C,0180,0A60,0000,1377     ;2910            ALU_R[0C].ORNOT.MASK,D_ALU
U 1377, 0001,003C,0180,09D0,0000,10F4     ;2911            RC[0A]_D
U 10F4, 0001,003D,0180,0AB0,0000,1016     ;2912    =0      R[6]_D,CALL,J/RELSUB
U 10F5, 0000,003C,01C0,0A30,0000,10F6     ;2913            Q_R[6]
U 10F6, 0001,203D,0180,0AC0,0000,1014     ;2914    =0      R[8]_Q,CALL,J/TBWRB
U 10F7, 0010,0038,0180,0908,0200,1378     ;2915            VA_RC[1]                   ; WRITE VA=4CCCC000 WITH
U 1378, 0810,0038,0180,0900,0000,10F8     ;2916            D_RC[0]                    ; PTE=A4155555 INTO TB GROUP 1
U 10F8, 0001,003D,0180,0AC0,0000,100C     ;2917    =0      R[8]_D,CALL,J/TBWR1
U 10F9, 0018,0038,1980,0800,0200,1379     ;2918            VA_K[ZERO]                 ; CLEAR THE VA
U 1379, 3000,003C,0180,0800,0000,137A     ;2919            IBC/START                  ; START IB REFERENCES
U 137A, 0000,003C,0180,F800,0000,137B     ;2920            FS/MCT,MCT/ALLOW.IB.READ ; LET THE IB DO 1 REFERENCE
U 137B, 0000,003C,0180,F800,0000,137C     ;2921            FS/MCT,MCT/ALLOW.IB.READ ; SO THAT THE IPA IS INCREMENTED
```

```
U 137C, 1000,003C,0180,F800,0000,137D   ;2922          IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; AND AUTO RELOAD OCCURS
U 137D, 0000,003C,0180,F800,0000,137E   ;2923          FS/MCT,MCT/ALLOW.IB.READ
U 137E, 0000,003C,69F0,2C00,0000,137F   ;2924          Q_ID[TIME.ADDR]          ; GET RELOADED IPA
U 137F, 0000,003C,0188,0800,0000,1380   ;2925          Q_Q.LEFT2,SI/ZERO        ; JUSTIFY ADDRESS IN Q PROPERLY
U 1380, 0000,003C,01A8,0800,0000,1381   ;2926          Q_Q.LEFT,SI/ZERO
U 1381, 0000,003C,01B0,0800,0000,1382   ;2927          Q_Q.RIGHT,SI/ZERO
U 1382, 0001,203C,0180,09E8,0000,1383   ;2928          RC[0D]_Q
U 1383, 0000,003C,4DF0,2C00,0000,1384   ;2929          Q_ID[TBER1]              ; GET THE TBER1 TO CHECK
U 1384, 0001,203C,0180,09D8,0000,1385   ;2930          RC[0B]_Q                 ; THE AUTO RELOAD BIT
U 1385, 0800,003C,0180,0A38,0000,1386   ;2931          D_R[7]                   ; CHECK THE RELOADED IPA
U 1386, 0100,003C,0180,0800,0000,1387   ;2932          D_D.LEFT2,SI/ZERO        ; WHICH SHOULD HAVE BEEN TRANSLATED
U 1387, 0001,003C,0180,09F0,0000,1388   ;2933          RC[0E]_D                 ; THRU TB GROUP 0
U 1388, 0010,0038,01C0,0968,0000,1389   ;2934          Q_RC[0D]
U 1389, 001D,2000,0180,0800,0010,138A   ;2935          A[U_Q-D,CLK.UBCC
U 138A, 0000,013C,0180,0800,0000,10FA   ;2936          Z?
U 10FA, 0000,003D,0180,0800,0000,1182   ;2937    =0    ERROR1                   ; IPA INCORRECT AFTER AUTO RELOAD
U 10FB, 0810,0038,0180,0958,0000,138B   ;2938          D_RC[0B]                 ; CHECK THE AUTO RELOAD
U 138B, 0819,0034,0580,0800,0000,138C   ;2939          A[U_D[AND]K[.1],D_ALU    ; BIT IN TBER1
U 138C, 0019,0000,0580,0800,0010,138D   ;2940          ALU_D-K[.1],CLK.UBCC
U 138D, 0000,013C,0180,0800,0000,10FC   ;2941          Z?
U 10FC, 0000,003D,0180,0800,0000,1182   ;2942    =0    ERROR1                   ; AUTO RELOAD BIT NOT SET
U 10FD, 0000,003C,0180,0A10,0010,138E   ;2943          ALU_R[2],CLK.UBCC        ; HAVE ALL TEST PATTERNS BEEN TRIED?
U 138E, 0000,013C,0180,0800,0000,10FE   ;2944          Z?
U 10FE, 0018,0000,0580,0A90,0000,10E5   ;2945    =0    R[2]_LA-K[.1],J/AR3A     ; IF NOT CONTINUE
U 10FF, 0000,003C,0180,0800,0000,110A   ;2946          NOP
```

```
                                  ;2947          .PAGE   "TEST F6        AUTO RELOAD TEST 5"
                                  ;2948  ;*******************************************************************
                                  ;2949  ;++
                                  ;2950  ; TEST  F6      AUTO RELOAD TEST 5
                                  ;2951  ;
                                  ;2952  ; TEST DESCRIPTION
                                  ;2953  ;       THIS IS A TEST OF THE AUTO RELOAD FUNCTION WITH
                                  ;2954  ;       THE VIBA BEING A HIT IN TB GROUP ONE AND MME=1
                                  ;2955  ;
                                  ;2956  ; LOGIC DESCRIPTION
                                  ;2957  ;       LOGIC ON TBM IS TESTED HERE
                                  ;2958  ;
                                  ;2959  ; ERROR DESCRIPTION
                                  ;2960  ;       EXPECTED IPA
                                  ;2961  ;       GOT IPA
                                  ;2962  ;       EXPECTED TBER1
                                  ;2963  ;       GOT TBER1
                                  ;2964  ;       PTE WRITTEN AT LOCATION VA=4CCCC000 IN TB GROUP 1
                                  ;2965  ;
                                  ;2966  ;--
                                  ;2967  ;*******************************************************************
                                  ;2968  =0
U 110A, 0000,003D,0180,0800,0000,116E  ;2969  AR4:    NEWTST
U 110B, 1F00,003C,0180,0800,0000,1110  ;2970          D_0,IBC/STOP            ; TURN OFF IB
U 1110, 0000,003D,4980,3C00,0000,1192  ;2971  =0      ID[TBER0]_D,CALL,J/SOFF ; TB AND SBI CYCLES OFF
U 1111, 0818,0038,5980,0800,0000,138F  ;2972          D_K[.7F]
U 138F, 0100,003C,0180,0800,0000,1390  ;2973          D_D.LEFT2,SI/ZERO
U 1390, 0001,003C,0180,0A80,0000,1112  ;2974          R[0]_D                  ; R[0]=1FC
U 1112, 081B,0001,0580,0800,0000,11E5  ;2975  =0      ALU_0-K[.1],D_ALU,CALL,J/DC0
U 1113, 0200,003C,0180,0800,0000,1391  ;2976          D_D.RIGHT2,SI/ZERO
U 1391, 0001,003C,0180,0A88,0000,1392  ;2977          R[1]_D                  ; R[1]=3FFFFFFC
U 1392, 0018,0038,2180,0A90,0000,1393  ;2978          R[2]_K[.14]
U 1393, 0818,0038,0580,09E0,0000,1394  ;2979          RC[0C]_K[.1],D_K[.1]
U 1394, 0019,0014,1180,09F8,0000,1114  ;2980          ALU_D+K[.4],RC[0F]_ALU
U 1114, 0000,003D,0180,0800,0000,11C3  ;2981  =0      CALL,J/TBWPTP           ; GET SOME TEST DATA PATTERNS
U 1115, 0000,003C,0180,0800,0000,1116  ;2982          NOP
U 1116, 0000,003D,0180,0800,0000,1181  ;2983  =0      ERLOOP
U 1117, 0F00,003C,0180,0800,0000,1395  ;2984  AR4A:   D_0                     ; TURN OFF TB
U 1395, 0000,003C,4980,3C00,0000,1396  ;2985          ID[TBER0]_D
U 1396, 0810,0038,0180,0908,0000,1397  ;2986          D_RC[1]                 ; LOAD 4CCCC000-4 INTO VIBA
U 1397, 2019,0000,1180,0AA8,0000,1398  ;2987          ALU_D-K[.4],R[5]_ALU,IBC/FLUSH
U 1398, 0000,003C,0180,0A00,0200,1399  ;2988          VA_R[0]                 ; LOAD IFC INTO VA
U 1399, 0000,003C,0180,9000,0000,1118  ;2989          FS/MCT,MCT/INVALIDATE   ; INVALIDATE LOCATION 1FC IN CACHE
U 1118, 0000,003D,0180,0800,0000,121E  ;2990  =0      CALL,J/ROS              : SET FORCE REPLACE GROUP 0 IN CACHE
U 1119, 0F00,003C,0180,0800,0000,139A  ;2991          D_0                     ; WRITE DATA=0 INTO GROUP 0
U 139A, 0000,003C,0180,9800,0000,139B  ;2992          FS/MCT,MCT/VALIDATE     ; OF THE CACHE
U 139B, 0000,003C,0180,6000,0000,139C  ;2993          FS/MCT,MCT/READ.V.NEWPC ; LOAD 1FC INTO IPA
U 139C, 0010,0038,0180,0908,0200,139D  ;2994          VA_RC[1]                ; WRITE VA=4CCCC000 WITH PTE
U 139D, 0010,0038,0180,0AA8,0000,139E  ;2995          R[5]_LC                 ; BEING THE TEST PATTERN INTO
U 139E, 0000,003C,0180,0A10,0082,139F  ;2996          SC_R[2]                 ; BOTH GROUP OF THE TB
U 139F, 0800,0034,0180,0A68,0000,13A0  ;2997          ALU_R[0D].AND.MASK,D_ALU
U 13A0, 080D,0030,0180,0A60,0000,13A1  ;2998          LAB_R[0C],ALU_D[OR]LB,D_ALU
U 13A1, 0001,003C,0180,09D0,0000,111A  ;2999          RC[0A]_D
U 111A, 0001,003D,0180,0AB0,0000,1016  ;3000  =0      R[6]_D,CALL,J/RELSUB
U 111B, 0000,003C,01C0,0A30,0000,111C  ;3001          Q_R[6]
```

```
U 111C, 0001,203D,0180,0AC0,0000,1014   ;3002   =0      R[8]_Q,CALL,J/TBWRB
U 111D, 0010,0038,0180,0920,0200,13A2   ;3003           VA_RC[4]                   ; WRITE 55554000 WITH PTE=A4199999
U 13A2, 0810,0038,0180,0918,0000,111E   ;3004           D_RC[3]                    ; INTO TB GROUP 0
U 111E, 0001,003D,0180,0AC0,0000,1012   ;3005   =0      R[8]_D,CALL,J/TBWRO
U 111F, 0018,0038,1980,0800,0200,13A3   ;3006           VA_K[ZERO]                 ; CLEAR THE VA
U 13A3, 3000,003C,0180,0800,0000,13A4   ;3007           IBC/START                  ; START IB REFERENCES
U 13A4, 0000,003C,0180,F800,0000,13A5   ;3008           FS/MCT,MCT/ALLOW.IB.READ ; LET THE IB DO 1 REFERENCE
U 13A5, 0000,003C,0180,F800,0000,13A6   ;3009           FS/MCT,MCT/ALLOW.IB.READ ; SO THE IPA GETS INCREMENTED AND
U 13A6, 1000,003C,0180,F800,0000,13A7   ;3010           IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; RELOADED FROM TB GROUP 1
U 13A7, 0000,003C,0180,F800,0000,13A8   ;3011           FS/MCT,MCT/ALLOW.IB.READ
U 13A8, 0000,003C,69F0,2C00,0000,13A9   ;3012           Q_ID[TIME.ADDR]            ; GET THE RELOADED IPA
U 13A9, 0000,003C,0188,0800,0000,13AA   ;3013           Q_Q.LEFT2,SI/ZERO          ; JUSTIFY THE ADDRESS IN Q PROPERLY
U 13AA, 0000,003C,01A8,0800,0000,13AB   ;3014           Q_Q.LEFT,SI/ZERO
U 13AB, 0000,003C,01B0,0800,0000,13AC   ;3015           Q_Q.RIGHT,SI/ZERO
U 13AC, 0001,203C,0180,09E8,0000,13AD   ;3016           RC[0D]_Q
U 13AD, 0000,003C,4DF0,2C00,0000,13AE   ;3017           Q_ID[TBER1]                ; GET THE TBER1 SO THAT
U 13AE, 0001,203C,0180,09D8,0000,13AF   ;3018           RC[0B]_Q                   ; AUTO RELOAD BIT CAN BE CHECKED
U 13AF, 0800,003C,0180,0A38,0000,13B0   ;3019           D_R[7]                     ; CHECK THE IPA WHICH
U 13B0, 0100,003C,0180,0800,0000,13B1   ;3020           D_D.LEFT2,SI/ZERO          ; SHOULD HAVE BEEN RELOADED
U 13B1, 0001,003C,0180,09F0,0000,13B2   ;3021           RC[0E]_D                   ; WITH AN ADDRESS RELOCATED
U 13B2, 0010,0038,01C0,0968,0000,13B3   ;3022           Q_RC[0D]                   ; FROM TB GROUP 1
U 13B3, 001D,2000,0180,0800,0010,13B4   ;3023           ALU_Q-D,CLK.UBCC
U 13B4, 0000,013C,0180,0800,0000,1120   ;3024           Z?
U 1120, 0000,003D,0180,0800,0000,1182   ;3025   =0      ERROR1                     ; IPA INCORRECT AFTER RELOADED
                                        ;3026                                      ; FROM GROUP 1
U 1121, 0810,0038,0180,0958,0000,13B5   ;3027           D_RC[0B]                   ; CHECK THE TBER1
U 13B5, 0819,0034,0580,0800,0000,13B6   ;3028           ALU_D[AND]K[.1],D_ALU      ; AUTO RELOAD BIT
U 13B6, 0019,0000,0580,0800,0010,13B7   ;3029           ALU_D-K[.1],CLK.UBCC
U 13B7, 0000,013C,0180,0800,0000,1122   ;3030           Z?
U 1122, 0000,003D,0180,0800,0000,1182   ;3031   =0      ERROR1                     ; AUTO RELOAD BIT NOT SET
U 1123, 0F00,003C,0180,0800,0000,13B8   ;3032           D_0                        ; TURN TB OFF
U 13B8, 0000,003C,4980,3C00,0000,13B9   ;3033           ID[TBER0]_D
U 13B9, 0810,0038,0180,0920,0000,13BA   ;3034           D_RC[4]                    ; LOAD 55554000-4 INTO VIBA
U 13BA, 2019,0000,1180,0AA8,0000,13BB   ;3035           ALU_D-K[.4],R[5]_ALU,IBC/FLUSH
U 13BB, 0000,003C,0180,0A00,0200,13BC   ;3036           VA_R[0]                    ; LOAD 1FC INTO VA
U 13BC, 0000,003C,0180,9000,0000,1124   ;3037           FS7MCT,MCT/INVALIDATE      ; INVALIDATE LOCATION 1FC IN CACHE
U 1124, 0000,003D,0180,0800,0000,121E   ;3038   =0      CALL,J/ROS                 ; SET FORCE REPLACE GROUP 0 IN CACHE
U 1125, 0F00,003C,0180,0800,0000,13BD   ;3039           D_0                        ; WRITE 0 INTO CACHE GROUP
U 13BD, 0000,003C,0180,9800,0000,13BE   ;3040           FS/MCT,MCT/VALIDATE        ; 0 AT LOCATION 1FC
U 13BE, 0000,003C,0180,6000,0000,13BF   ;3041           FS/MCT,MCT/READ.V.NEWPC ; LOAF 1FC INTO IPA
U 13BF, 0010,0038,0180,0920,0200,13C0   ;3042           VA_RC[4]                   ; MAKE VA=55554000 WITH PTE
U 13C0, 0010,0038,0180,0AA8,0000,13C1   ;3043           R[5]_LC                    ; BEING THE TEST PATTERN
U 13C1, 0000,003C,0180,0A10,0082,13C2   ;3044           SC_R[2]                    ; A HIT IN TB GROUP 0 AND 1
U 13C2, 0800,001C,0180,0A60,0000,13C3   ;3045           ALU_R[0C].ORNOT.MASK,D_ALU
U 13C3, 0001,003C,0180,09D0,0000,1126   ;3046           RC[0A]_D
U 1126, 0001,003D,0180,0AB0,0000,1016   ;3047   =0      R[6]_D,CALL,J/RELSUB
U 1127, 0000,003C,01C0,0A30,0000,1128   ;3048           Q_R[6]
U 1128, 0001,203D,0180,0AC0,0000,1014   ;3049   =0      R[8]_Q,CALL,J/TBWRB
U 1129, 0010,0038,0180,0908,0200,13C4   ;3050           VA_RC[1]                   ; MAKE VA=4CCCC000 AND PTE=A4155555
U 13C4, 0810,0038,0180,0900,0000,112A   ;3051           D_RC[0]                    ; A HIT IN TB GROUP 0
U 112A, 0001,003D,0180,0AC0,0000,1012   ;3052   =0      R[8]_D,CALL,J/TBWRO
U 112B, 0018,0038,1980,0800,0200,13C5   ;3053           VA_K[ZERO]                 ; CLEAR THE VA
U 13C5, 3000,003C,0180,0800,0000,13C6   ;3054           IBC/START                  ; START IB REFERENCES
U 13C6, 0000,003C,0180,F800,0000,13C7   ;3055           FS/MCT,MCT/ALLOW.IB.READ ; LET THE IB DO 1 REFERENCE SO
U 13C7, 0000,003C,0180,F800,0000,13C8   ;3056           FS/MCT,MCT/ALLOW.IB.READ ; THE IPA GETS INCREMENTED AND
```

```
U 13C8, 1000,003C,0180,F800,0000,13C9   ;3057           IBC/STOP,FS/MCT,MCT/ALLOW.IB.READ ; RELOADED FROM GROUP 1
U 13C9, 0000,003C,0180,F800,0000,13CA   ;3058           FS/MCT,MCT/ALLOW.IB.READ
U 13CA, 0000,003C,69F0,2C00,0000,13CB   ;3059           Q_ID[TIME.ADDR]          ; GET THE RELOADED IPA
U 13CB, 0000,003C,0188,0800,0000,13CC   ;3060           Q_Q.LEFT2,SI/ZERO        ; JUSTIFY THE ADDRESS IN Q PROPERLY
U 13CC, 0000,003C,01A8,0800,0000,13CD   ;3061           Q_Q.LEFT,SI/ZERO
U 13CD, 0000,003C,01B0,0800,0000,13CE   ;3062           Q_Q.RIGHT,SI/ZERO
U 13CE, 0001,203C,0180,09E8,0000,13CF   ;3063           RC[OD]_Q
U 13CF, 0000,003C,4DF0,2C00,0000,13D0   ;3064           Q_ID[TBER1]              ; GET TBER1 SO THAT
U 13D0, 0001,203C,0180,09D8,0000,13D1   ;3065           RC[OB]_Q                 ; THE AUTO RELOAD BIT CAN BE CHECKED
U 13D1, 0800,003C,0180,0A38,0000,13D2   ;3066           D_R[7]                   ; CHECK THE IPA WHICH
U 13D2, 0100,003C,0180,0800,0000,13D3   ;3067           D_D.LEFT2,SI/ZERO        ; SHOULD HAVE BEEN RELOADED
U 13D3, 0001,003C,0180,09F0,0000,13D4   ;3068           RC[OE]_D                 ; WITH AN ADDRESS RELOCATED
U 13D4, 0010,0038,01C0,0968,0000,13D5   ;3069           Q_RC[OD]                 ; THRU TB GROUP 1
U 13D5, 001D,2000,0180,0800,0010,13D6   ;3070           ALU_Q-D,CLK.UBCC
U 13D6, 0000,013C,0180,0800,0000,112C   ;3071           Z?
U 112C, 0000,003D,0180,0800,0000,1182   ;3072   =0      ERROR1                   ; IPA INCORRECT AFTER RELOAD
U 112D, 0810,0038,0180,0958,0000,13D7   ;3073           D_RC[OB]                 ; CHECK THE AUTO
U 13D7, 0819,0034,0580,0800,0000,13D8   ;3074           ALU_D[AND]K[.1],D_ALU    ; RELOAD BIT IN TBER1
U 13D8, 0019,0000,0580,0800,0010,13D9   ;3075           ALU_D-K[.1],CLK.UBCC
U 13D9, 0000,013C,0180,0800,0000,112E   ;3076           Z?
U 112E, 0000,003D,0180,0800,0000,1182   ;3077   =0      ERROR1                   ; TBER1 AUTO RELOAD BIT NOT SET
U 112F, 0000,003C,0180,0A10,0010,13DA   ;3078           ALU_R[2],CLK.UBCC        ; TESTED ALL PATTERNS?
U 13DA, 0000,013C,0180,0800,0000,1130   ;3079           Z?
U 1130, 0018,0000,0580,0A90,0000,1117   ;3080   =0      R[2]_LA-K[.1],J/AR4A     ; IF NOT CONTINUE
U 1131, 0000,003C,0180,0800,0000,1132   ;3081           NOP
                                        ;3082   =0
U 1132, 0000,003D,0180,0800,0000,116E   ;3083   DUMOF7: NEWTST
U 1133, 0000,003C,0180,0800,0000,1134   ;3084           NOP
                                        ;3085   =0
U 1134, 0000,003D,0180,0800,0000,116E   ;3086   DUMOF8: NEWTST
U 1135, 0000,003C,0180,0800,0000,1136   ;3087           NOP
                                        ;3088   =0
U 1136, 0000,003D,0180,0800,0000,116E   ;3089   DUMOF9: NEWTST
U 1137, 0000,003C,0180,0800,0000,1138   ;3090           NOP
                                        ;3091   =0
U 1138, 0000,003D,0180,0800,0000,116E   ;3092   DUMOFA: NEWTST
U 1139, 0000,003C,0180,0800,0000,113A   ;3093           NOP
                                        ;3094   =0
U 113A, 0000,003D,0180,0800,0000,116E   ;3095   DUMOFB: NEWTST
U 113B, 0000,003C,0180,0800,0000,113C   ;3096           NOP
                                        ;3097   =0
U 113C, 0000,003D,0180,0800,0000,116E   ;3098   DUMOFC: NEWTST
U 113D, 0000,003C,0180,0800,0000,113E   ;3099           NOP
                                        ;3100   =0
U 113E, 0000,003D,0180,0800,0000,116E   ;3101   DUMOFD: NEWTST
U 113F, 0000,003C,0180,0800,0000,1140   ;3102         . NOP
                                        ;3103   =0
U 1140, 0000,003D,0180,0800,0000,116E   ;3104   DUMOFE: NEWTST
U 1141, 0000,003C,0180,0800,0000,1142   ;3105           NOP
                                        ;3106   =0
U 1142, 0000,003D,0180,0800,0000,116E   ;3107   DUMOFF: NEWTST
U 1143, 0000,003C,0180,0800,0000,1144   ;3108           NOP
                                        ;3109   =0
U 1144, 0000,003D,0180,0800,0000,116E   ;3110   DUM100: NEWTST
U 1145, 0000,003C,0180,0800,0000,1146   ;3111           NOP
```

```
                                            ;3112     =0
U 1146, 0000,003D,0180,0800,0000,116E       ;3113     DUM101: NEWTST
U 1147, 0000,003C,0180,0800,0000,1148       ;3114             NOP
                                            ;3115     =0
U 1148, 0000,003D,0180,0800,0000,116E       ;3116     DUM102: NEWTST
U 1149, 0000,003C,0180,0800,0000,114A       ;3117             NOP
                                            ;3118     =0
U 114A, 0000,003D,0180,0800,0000,116E       ;3119     DUM103: NEWTST
U 114B, 0000,003C,0180,0800,0000,114C       ;3120             NOP
                                            ;3121     =0
U 114C, 0000,003D,0180,0800,0000,116E       ;3122     DUM104: NEWTST
U 114D, 0000,003C,0180,0800,0000,114E       ;3123             NOP
                                            ;3124     =0
U 114E, 0000,003D,0180,0800,0000,116E       ;3125     DUM105: NEWTST
U 114F, 0000,003C,0180,0800,0000,1150       ;3126             NOP
                                            ;3127     =0
U 1150, 0000,003D,0180,0800,0000,116E       ;3128     DUM106: NEWTST
U 1151, 0000,003C,0180,0800,0000,1152       ;3129             NOP
                                            ;3130     =0
U 1152, 0000,003D,0180,0800,0000,116E       ;3131     DUM107: NEWTST
U 1153, 0000,003C,0180,0800,0000,1156       ;3132             NOP
                                            ;3133     =0
U 1156, 0000,003D,0180,0800,0000,116E       ;3134     DUM108: NEWTST
U 1157, 0000,003C,0180,0800,0000,1158       ;3135             NOP
                                            ;3136     =0
U 1158, 0000,003D,0180,0800,0000,116E       ;3137     DUM109: NEWTST
U 1159, 0000,003C,0180,0800,0000,115A       ;3138             NOP
                                            ;3139     =0
U 115A, 0000,003D,0180,0800,0000,116E       ;3140     DUM10A: NEWTST
U 115B, 0000,003C,0180,0800,0000,115C       ;3141             NOP
                                            ;3142     =0
U 115C, 0000,003D,0180,0800,0000,116E       ;3143     DUM10B: NEWTST
U 115D, 0000,003C,0180,0800,0000,115E       ;3144             NOP
                                            ;3145     =0
U 115E, 0000,003D,0180,0800,0000,116E       ;3146     DUM10C: NEWTST
U 115F, 0000,003C,0180,0800,0000,1160       ;3147             NOP
                                            ;3148     =0
U 1160, 0000,003D,0180,0800,0000,116E       ;3149     DUM10D: NEWTST
U 1161, 0000,003C,0180,0800,0000,1162       ;3150             NOP
                                            ;3151     =0
U 1162, 0000,003D,0180,0800,0000,116E       ;3152     DUM10E: NEWTST
U 1163, 0000,003C,0180,0800,0000,1164       ;3153             NOP
                                            ;3154     =0
U 1164, 0000,003D,0180,0800,0000,116E       ;3155     DUM10F: NEWTST
U 1165, 0000,003C,0180,0800,0000,13DB       ;3156             NOP
U 13DB, 0000,003D,0180,0800,0000,116E       ;3157     DUMMY:  NEWTST
```

```
;                                  Location / Line Number Index

;Location       0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 0000 - 0FFF Unused
U 1000          1871:   1838    1845=   1861=   1862=   1863=   1952=   1953=
U 1008          1971=   1972=   1973=   1974=   1983=   1984=   1985=   1986=
U 1010          1987=   1988=   1993=   1994=   1997=   1998=   2007=   2008=
U 1018          2009=   2010=   2026=   2027=   2028=   2029=   2039=   2040=
U 1020          2053=   2054=   2058=   2059=   2074=   2075=   2077=   2078=
U 1028          2082=   2083=   2123=   2124=   2128=   2129=   2131=   2132=
U 1030          2133=   2134=   2138=   2139=   2141=   2142=   2143=   2144=
U 1038          2148=   2149=   2151=   2152=   2153=   2154=   2158=   2159=
U 1040          2161=   2162=   2168=   2169=   2170=   2171=   2196=   2197=
U 1048          2199=   2200=   2202=   2203=   2206=   2207=   1902:   1839
U 1050          2209=   2210=   2212=   2213=   2216=   2217=   2220=   2221=
U 1058          2226=   2227=   1905:   1840    2229=   2230=   1908:   1841
U 1060          2239=   2240=   2242=   2243=   2245=   2246=   2248=   2249=
U 1068          2263=   2264=   2271=   2272=   2285=   2286=   2338=   2339=
U 1070          2340=   2341=   2347=   2348=   2352=   2353=   2372=   2373=
U 1078          2375=   2376=   2396=   2397=   2398=   2399=   2404=   2405=
U 1080          2411=   2412=   2428=   2429=   2431=   2432=   2453=   2454=
U 1088          2455=   2456=   2459=   2460=   2465=   2466=   2472=   2473=
U 1090          2495=   2496=   2500=   2501=   2507=   2508=   2530=   2531=
U 1098          2535=   2536=   2538=   2539=   2565=   2566=   2567=   2568=
U 10A0          2571=   2572=   2576=   2577=   2580=   2581=   2590=   2591=
U 10A8          2596=   2597=   2600=   2601=   2620=   2622=   2626=   2627=
U 10B0          2636=   2637=   2642=   2643=   2646=   2647=   2666=   2668=
U 10B8          2672=   2673=   2675=   2676=   2699=   2700=   2701=   2702=
U 10C0          2705=   2706=   2711=   2712=   2715=   2716=   2725=   2726=
U 10C8          2731=   2732=   2735=   2736=   2755=   2756=   2760=   2761=
U 10D0          2770=   2771=   2776=   2777=   2781=   2782=   2801=   2803=
U 10D8          2807=   2808=   2810=   2811=   2834=   2835=   2836=   2837=
U 10E0          2840=   2841=   2846=   2847=   2848=   2849=   2855=   2856=
U 10E8          2865=   2866=   2867=   2868=   2870=   2871=   2890=   2892=
U 10F0          2896=   2897=   2903=   2904=   2912=   2913=   2914=   2915=
U 10F8          2917=   2918=   2937=   2938=   2942=   2943=   2945=   2946=
U 1100          1825:   1826:   1827:   1828:   1829:   1830:   1831:   1832:
U 1108          1833:   1842    2969=   2970=   1834:   1835:   1836:   1837:
U 1110          2971=   2972=   2975=   2976=   2981=   2982=   2983=   2984=
U 1118          2990=   2991=   3000=   3001=   3002=   3003=   3005=   3006=
U 1120          3025=   3027=   3031=   3032=   3038=   3039=   3047=   3048=
U 1128          3049=   3050=   3052=   3053=   3072=   3073=   3077=   3078=
U 1130          3080=   3081=   3083=   3084=   3086=   3087=   3089=   3090=
U 1138          3092=   3093=   3095=   3096=   3098=   3099=   3101=   3102=
U 1140          3104=   3105=   3107=   3108=   3110=   3111=   3113=   3114=
U 1148          3116=   3117=   3119=   3120=   3122=   3123=   3125=   3126=
U 1150          3128=   3129=   3131=   3132=   1843    1928:   3134=   3135=
U 1158          3137=   3138=   3140=   3141=   3143=   3144=   3146=   3147=
U 1160          3149=   3150=   3152=   3153=   3155=   3156=   1844    1864
U 1168          1865    1866    1867    1868    1869    1870    1880    1881
U 1170          1882    1883    1884    1885    1886    1887    1888    1889
U 1178          1890    1891    1892    1893    1894    1895    1896    1897
U 1180          1898    1899    1900    1901    1903    1904    1936    1937
U 1188          1943    1944    1945    1951    1954    1955    1958    1959
U 1190          1960    1961    1964    1965    1966    1989    1990    2000
U 1198          2011    2012    2013    2019    2020    2021    2022    2023
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0           2024    2025    2030    2031    2032    2033    2034    2035
U 11A8           2036    2037    2038    2045    2046    2047    2048    2049
U 11B0           2050    2051    2052    2055    2056    2057    2066    2067
U 11B8           2068    2069    2070    2071    2072    2073    2076    2079
U 11C0           2080    2081    2085    2111    2112    2113    2114    2115
U 11C8           2116    2117    2118    2119    2120    2121    2122    2125
U 11D0           2126    2127    2130    2135    2136    2137    2140    2145
U 11D8           2146    2147    2150    2155    2156    2157    2160    2166
U 11E0           2167    2173    2174    2175    2176    2177    2178    2179
U 11E8           2180    2181    2182    2183    2184    2185    2186    2187
U 11F0           2188    2189    2190    2191    2192    2193    2194    2198
U 11F8           2204    2208    2214    2218    2222    2224    2228    2250
U 1200           2251    2252    2253    2254    2255    2256    2257    2258
U 1208           2259    2260    2261    2262    2265    2266    2267    2268
U 1210           2269    2270    2273    2274    2278    2279    2280    2281
U 1218           2282    2283    2284    2291    2292    2293    2295    2296
U 1220           2297    2298    2300    2301    2303    2304    2306    2307
U 1228           2309    2310    2311    2313    2314    2315    2317    2342
U 1230           2343    2344    2345    2346    2349    2350    2351    2354
U 1238           2355    2356    2357    2358    2359    2360    2361    2362
U 1240           2363    2364    2365    2366    2367    2368    2369    2370
U 1248           2371    2374    2400    2401    2402    2403    2406    2407
U 1250           2408    2409    2410    2413    2414    2415    2416    2417
U 1258           2418    2419    2420    2421    2422    2423    2424    2425
U 1260           2426    2427    2430    2457    2458    2461    2462    2463
U 1268           2464    2467    2468    2469    2470    2471    2474    2475
U 1270           2476    2477    2478    2479    2480    2481    2482    2483
U 1278           2484    2485    2486    2487    2488    2489    2490    2491
U 1280           2492    2493    2494    2497    2498    2499    2502    2503
U 1288           2504    2505    2506    2509    2510    2511    2512    2513
U 1290           2514    2515    2516    2517    2518    2519    2520    2521
U 1298           2522    2523    2524    2525    2526    2527    2528    2529
U 12A0           2532    2533    2534    2537    2569    2570    2573    2574
U 12A8           2575    2578    1929:   2579    2582    2583    2584    2585
U 12B0           2586    2587    2588    2589    2592    2593    2594    2595
U 12B8           2598    2599    2602    2603    2604    2605    2606    2607
U 12C0           2608    2609    2610    2611    2612    2613    2614    2615
U 12C8           2616    2617    2618    2619    2623    2624    2625    2628
U 12D0           2629    2630    2631    2632    2633    2634    2635    2638
U 12D8           2639    2640    2641    2644    2645    2648    2649    2650
U 12E0           2651    2652    2653    2654    2655    2656    2657    2658
U 12E8           2659    2660    2661    2662    2663    2664    2665    2669
U 12F0           2670    2671    2674    2703    2704    2707    2708    2709
U 12F8           2710    2713    2714    2717    2718    2719    2720    2721
U 1300           2722    2723    2724    2727    2728    2729    2730    2733
U 1308           2734    2737    2738    2739    2740    2741    2742    2743
U 1310           2744    2745    2746    2747    2748    2749    2750    2751
U 1318           2752    2753    2754    2757    2758    2759    2762    2763
U 1320           2764    2765    2766    2767    2768    2769    2772    2773
U 1328           2774    2775    2778    2779    2780    2783    2784    2785
U 1330           2786    2787    2788    2789    2790    2791    2792    2793
U 1338           2794    2795    2796    2797    2798    2799    2800    2804
U 1340           2805    2806    2809    2838    2839    2842    2843    2844
```

```
;Location       0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348          2845    2850    2851    2852    2853    2854    2857    2858
U 1350          2859    2860    2861    2862    2863    2864    2869    2872
U 1358          2873    2874    2875    2876    2877    2878    2879    2880
U 1360          2881    2882    2883    2884    2885    2886    2887    2888
U 1368          2889    2893    2894    2895    2898    2899    2900    2901
U 1370          2902    2905    2906    2907    2908    2909    2910    2911
U 1378          2916    2919    2920    2921    2922    2923    2924    2925
U 1380          2926    2927    2928    2929    2930    2931    2932    2933
U 1388          2934    2935    2936    2939    2940    2941    2944    2973
U 1390          2974    2977    2978    2979    2980    2985    2986    2987
U 1398          2988    2989    2992    2993    2994    2995    2996    2997
U 13A0          2998    2999    3004    3007    3008    3009    3010    3011
U 13A8          3012    3013    3014    3015    3016    3017    3018    3019
U 13B0          3020    3021    3022    3023    3024    3028    3029    3030
U 13B8          3033    3034    3035    3036    3037    3040    3041    3042
U 13C0          3043    3044    3045    3046    3051    3054    3055    3056
U 13C8          3057    3058    3059    3060    3061    3062    3063    3064
U 13D0          3065    3066    3067    3068    3069    3070    3071    3074
U 13D8          3075    3076    3079    3157
U 13E0 - 13EF Unused
U 13F0          1912:   1913:   1914:   1915:   1916:   1917:   1918:   1919:
U 13F8          1920:   1921:   1922:   1923:   1924:   1925:   1926:   1927:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH32       1004

Used            1004
Remaining

Total microwords used in memory U: 1004
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH32.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 2306  TEST 110         INSTRUCTION BUFFER STALL
; 2356  TEST 111         A FORK TEST OF OPCODE 00 THRU 05 AND OPCODE FF
; 2454  TEST 112         BYTE 0 SHIFT CONTROL
; 2659  TEST 113         BYTE 1 SHIFT CONTROL
; 2913  TEST 114         BYTE 2-6 SHIFT CONTROL
; 3376  TEST 115         BYTE ROTATOR DATA INTEGRITY
```

```
                            ;1       .NOLIST
                            ;1804    .LIST
                            ;1805
```

```
                                          .REGION/1000,13FF

                                          ;+
                                          ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                          ; WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
                                          ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                          ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                          ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                          ;
                                          ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                          ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                          ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                          ;       R[OF] AND DO A RETURNO.
                                          ;
                                          ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                          ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                          ; TO THE CONSOLE.
                                          ;
                                          ; THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
                                          ; ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURNO IF THE TRAP WAS
                                          ; EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
                                          ; RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
                                          ; STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.
                                          ;-

U 1100, 0000,003C,19C0,0A78,0084,7001     1100:   SC_K[ZERO],Q_R[OF],J/TRPHO       ; SYSTEM INIT
U 1101, 0000,003C,05C0,0A78,0084,7001     1101:   SC_K[.1],Q_R[OF],J/TRPHO         ; DATA UNALIGNED
U 1102, 0000,003C,09C0,0A78,0084,7001     1102:   SC_K[.2],Q_R[OF],J/TRPHO         ; X PAGE ERROR
U 1103, 0000,003C,0DC0,0A78,0084,7001     1103:   SC_K[.3],Q_R[OF],J/TRPHO         ; TB MODIFY
U 1104, 0000,003C,11C0,0A78,0084,7001     1104:   SC_K[.4],Q_R[OF],J/TRPHO         ; TB PROT ERROR
U 1105, 0000,003C,D5C0,0A78,0084,7001     1105:   SC_K[.6],Q_R[OF],J/TRPHO         ; TB MISS
U 1106, 0000,003C,D9C0,0A78,0084,7001     1106:   SC_K[.9],Q_R[OF],J/TRPHO         ; RES FLOAT OPER
U 1107, 0000,003C,5DC0,0A78,0084,7001     1107:   SC_K[.7],Q_R[OF],J/TRPHO         ; TB PARITY
U 1108, 0000,003C,01C0,0A78,0084,7001     1108:   SC_K[.8],Q_R[OF],J/TRPHO         ; CACHE PARITY
U 110C, 0000,003C,85C0,0A78,0084,7001     110C:   SC_K[.C],Q_R[OF],J/TRPHO         ; RDS
U 110D, 0000,003C,89C0,0A78,0084,7001     110D:   SC_K[.D],Q_R[OF],J/TRPHO         ; TIME OUT
U 110E, 0000,003C,65C0,0A78,0084,7001     110E:   SC_K[.10],Q_R[OF],J/TRPHO        ; ODD ADDRESS
U 110F, 0000,003C,61C0,0A78,0084,71DD     110F:   SC_K[.F],Q_R[OF],J/TRPH2         ; CS PARITY

U 1001, 0001,2024,0180,0800,0010,104F     TRPHO:  ALU_Q.ANDNOT.MASK,CLK.UBCC       ; WAS TRAP EXPECTED?
U 104F, 0000,013C,0180,0800,0000,1002             Z?                               ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000     =0      ALU_Q[AND]MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN



                                          ;+
                                          ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                          ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                          ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                          ;
                                          ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                          ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                          ;             FAULT STATUS REGISTER
                                          ;             SBI ERROR REGISTER
                                          ;             TIMEOUT ADDRESS REGISTER
                                          ;             MAINTENANCE REGISTER
```

```
                                      ;1861   ;             CACHE PARITY REGISTER
                                      ;1862   ;             TB ERROR REGISTER 1
                                      ;1863   ;             TB ERROR REGISTER 0
                                      ;1864   ;-
                                      ;1865
U 1003, 0018,0038,1D80,09E8,0000,1004 ;1866   TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,730F ;1867   =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,105B ;1868           Q_ID[TBER0]
U 105B, 0001,203C,4DF0,2DB0,0000,105F ;1869           RC[6]_Q,Q_ID[TBER1]
U 105F, 0001,203C,65F0,2DB8,0000,1109 ;1870           RC[7]_Q,Q_ID[SBI.ERR]
U 1109, 0001,203C,6DF0,2DD8,0000,1154 ;1871           RC[0B]_Q,Q_ID[FAULT]
U 1154, 0001,203C,75F0,2DE0,0000,11DA ;1872           RC[0C]_Q,Q_ID[MAINT]
U 11DA, 0001,203C,79F0,2DC8,0000,11DB ;1873           RC[9]_Q,Q_ID[PARITY]
U 11DB, 0001,203C,69F0,2DC0,0000,11DC ;1874           RC[8]_Q,Q_ID[TIME.ADDR]
U 11DC, 0001,203C,81F0,2DD0,0000,1000 ;1875           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,11F4 ;1876   1000:   RC[0E]_Q,ERROR1
                                      ;1877
                                      ;1878   ;+
                                      ;1879   ; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
                                      ;1880   ;-
                                      ;1881
U 11DD, 0001,2024,0180,0800,0010,11DE ;1882   TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS THE TRAP EXPECTED?
U 11DE, 0000,013C,0180,0800,0000,1006 ;1883           Z?                              ; BRANCH IF NO
U 1006, 0001,2036,0180,0AF8,0000,0001 ;1884   =0      ALU_Q[AND]MASK,R[0F]_ALU,RETURN1 ; RETURN
U 1007, 0000,003C,0180,0800,0000,1003 ;1885           J/TRPH1                         ; REPORT UNEXPECTED TRAP
                                      ;1886
                                      ;1887
                                      ;1888   ;+
                                      ;1889   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                      ;1890   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                      ;1891   ;               NEWTST
                                      ;1892   ;               ERLOOP
                                      ;1893   ;               ERROR1
                                      ;1894   ;               ERROR2
                                      ;1895   ;
                                      ;1896
U 11DF, 0000,003C,65F8,0800,0084,71E0 ;1897   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 11E0, 0818,0038,8D80,0800,0000,11E1 ;1898           D_K[.1F]                        ; ...
U 11E1, 0D00,003C,0180,0800,0000,11E2 ;1899           D_DAL.SC
U 11E2, 0000,003C,3D80,3C00,0000,11E3 ;1900           ID[PSL]_D                       ; WRITE THE PSL
U 11E3, 0818,0038,0580,0800,0000,11E4 ;1901           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 11E4, 0D00,003C,0180,0800,0000,11E5 ;1902           D_DAL.SC
U 11E5, 0F00,003C,3180,3C00,0000,11E6 ;1903           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 11E6, 0000,003C,5D80,3C00,0000,11E7 ;1904           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 11E7, 0000,003C,3980,3C00,0000,11E8 ;1905           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 11E8, 0000,003C,2980,3C00,0000,11E9 ;1906           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 11E9, 0000,003C,4980,3C00,0000,11EA ;1907           ID[TBER0]_D                     ; SHUT OFF THE TB
U 11EA, 0000,003C,7180,3C00,0000,11EB ;1908           ID[COMP]_D                      ; CLEAR SILO COMPARATOR
U 11EB, 0818,0038,C180,0800,0000,11EC ;1909           D_K[.FFFF]
U 11EC, 0000,003C,6580,3C00,0000,11ED ;1910           ID[SBI.ERR]_D
U 11ED, 0F00,003C,6D80,3C00,0000,11EE ;1911           ID[FAULT]_D,D_0
U 11EE, 0000,003C,6D80,3C00,0000,11EF ;1912           ID[FAULT]_D
U 11EF, 0000,003C,6580,3C00,0000,11F0 ;1913           ID[SBI.ERR]_D
U 11F0, 0003,003C,0180,09F0,0000,11F1 ;1914           RC[0E]_0
U 11F1, 0003,003C,0180,0AF8,0000,11F2 ;1915           R[0F]_0
```

```
U 11F2, 0003,003C,0180,09E8,0000,105E    ;1916            RC[OD]_0,J/CALLCON                  ; CALL THE CONSOLE
U 11F3, 0818,0038,0980,0800,0000,105E    ;1917    ERLOOP: D_K[.2],J/CALLCON                   ; ERRLOOP CALL
U 11F4, 0810,0038,0180,0978,0000,11F5    ;1918    ERROR1: D_RC[OF]
U 11F5, 0819,0034,4D80,0800,0000,104E    ;1919            D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E    ;1920    104E:   D_D.OR.K[.4],J/CALLCON
                                         ;1921
U 11F6, 0810,0038,0180,0978,0000,11F7    ;1922    ERROR2: D_RC[OF]
U 11F7, 0819,0034,4D80,0800,0000,105A    ;1923            D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E    ;1924    105A:   D_D.OR.K[.6],J/CALLCON
                                         ;1925
                                         ;1926    105E:
                                         ;1927    CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E    ;1928            ID[TXDB]_D,J/CALLCON                ; CALL THE CONSOLE
                                         ;1929
                                         ;1930    ;+
                                         ;1931    ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                         ;1932    ;-
                                         ;1933
U 13F0, 0000,003C,0180,0800,0000,13F1    ;1934    13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2    ;1935    13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3    ;1936    13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4    ;1937    13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5    ;1938    13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6    ;1939    13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7    ;1940    13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8    ;1941    13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9    ;1942    13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA    ;1943    13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB    ;1944    13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC    ;1945    13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD    ;1946    13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE    ;1947    13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF    ;1948    13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,11F8    ;1949    13FF:   NOP
                                         ;1950
                                         ;1951
                                         ;1952    ;+
                                         ;1953    ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
                                         ;1954    ; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
                                         ;1955    ; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
                                         ;1956    ; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
                                         ;1957    ;
                                         ;1958    ; FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
                                         ;1959    ;       THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
                                         ;1960    ;
                                         ;1961    ;               =0      D_0,CALL,J/DC5
                                         ;1962    ;                       NOP
                                         ;1963    ;               =0      CALL,J/DC5
                                         ;1964    ;-
                                         ;1965
U 11F8, 0018,0038,1980,0800,0000,1308    ;1966    DC0:    ALU_0(K),J/S00
U 11F9, 0018,0038,1980,0800,0000,1309    ;1967    DC1:    ALU_0(K),J/S01
U 11FA, 0018,0038,1980,0800,0000,130A    ;1968    DC2:    ALU_0(K),J/S10
U 11FB, 0018,0038,1980,0800,0000,130B    ;1969    DC3:    ALU_0(K),J/S11
U 11FC, 0018,0038,0980,0800,0000,1308    ;1970    DC4:    ALU_K[.2],J/S00
```

```
U 11FD, 0018,0038,0980,0800,0000,1309   ;1971   DC5:    ALU_K[.2],J/S01
U 11FE, 0018,0038,0980,0800,0000,130A   ;1972   DC6:    ALU_K[.2],J/S10
U 11FF, 0018,0038,0980,0800,0000,130B   ;1973   DC7:    ALU_K[.2],J/S11
U 1300, 0018,0038,0580,0800,0000,1308   ;1974   DC8:    ALU_K[.1],J/S00
U 1301, 0018,0038,0580,0800,0000,1309   ;1975   DC9:    ALU_K[.1],J/S01
U 1302, 0018,0038,0580,0800,0000,130A   ;1976   DCA:    ALU_K[.1],J/S10
U 1303, 0018,0038,0580,0800,0000,130B   ;1977   DCB:    ALU_K[.1],J/S11
U 1304, 0018,0038,C180,0800,0000,1308   ;1978   DCC:    ALU_K[.FFFF],J/S00
U 1305, 0018,0038,C180,0800,0000,1309   ;1979   DCD:    ALU_K[.FFFF],J/S01
U 1306, 0018,0038,C180,0800,0000,130A   ;1980   DCE:    ALU_K[.FFFF],J/S10
U 1307, 0018,0038,C180,0800,0000,130B   ;1981   DCF:    ALU_K[.FFFF],J/S11
                                        ;1982
U 1308, 0118,0038,1B80,0800,0000,130C   ;1983   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 1309, 0118,0038,0B80,0800,0000,130C   ;1984   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 130A, 0118,0038,0780,0800,0000,130C   ;1985   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 130B, 0118,0038,C380,0800,0000,130C   ;1986   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
                                        ;1987
U 130C, 0100,003E,0380,0800,0000,0001   ;1988   SX:     D_D.LEFT2,SI/7,RETURN1          ; EXIT
                                        ;1989
                                        ;1990
                                        ;1991   ;+
                                        ;1992   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1993   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1994   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1995   ; TYPING IT.
                                        ;1996   ;-
                                        ;1997
U 130D, 0810,0038,4D80,0978,0000,130E   ;1998   SUBTST: D_RC[OF],KMX/.FF00
U 130E, 0019,4016,4D80,09F8,0000,0001   ;1999           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;2000
                                        ;2001   ;+
                                        ;2002   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;2003   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;2004   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;2005   ;-
                                        ;2006
U 130F, 0010,0038,01C0,0978,0000,1310   ;2007   SETRCF: Q_RC[OF]
U 1310, 0019,2034,4DC0,0800,0000,1311   ;2008           Q_Q.AND.K[.FF00]
U 1311, 0019,2032,1D80,09F8,0000,0001   ;2009           RC[OF]_Q.OR.SC,RETURN1
                                        ;2010
```

```
                                           ;2011
                                           ;2012     ;+
                                           ;2013     ; THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
                                           ;2014     ; THE INSTRUCTION AT LOCATION "DISPAT" LOADS THE Q REGISTER WITH HEX 100
                                           ;2015     ; AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
                                           ;2016     ; THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
                                           ;2017     ; THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
                                           ;2018     ; THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.
                                           ;2019     ;-
                                           ;2020
                                           ;2021     SYNC00:
U 1312, 0038,003B,41C0,0800,0000,1200      ;2022     DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/DISPATTBL
                                           ;2023
                                           ;2024
                                           ;2025     1200:
                                           ;2026     DISPATTBL:
U 1200, 0019,2000,05C0,0800,0000,1201      ;2027     1200:   Q_Q-K[.1]
U 1201, 0019,2000,05C0,0800,0000,1202      ;2028     1201:   Q_Q-K[.1]
U 1202, 0019,2000,05C0,0800,0000,1203      ;2029     1202:   Q_Q-K[.1]
U 1203, 0019,2000,05C0,0800,0000,1204      ;2030     1203:   Q_Q-K[.1]
U 1204, 0019,2000,05C0,0800,0000,1205      ;2031     1204:   Q_Q-K[.1]
U 1205, 0019,2000,05C0,0800,0000,1206      ;2032     1205:   Q_Q-K[.1]
U 1206, 0019,2000,05C0,0800,0000,1207      ;2033     1206:   Q_Q-K[.1]
U 1207, 0019,2000,05C0,0800,0000,1208      ;2034     1207:   Q_Q-K[.1]
U 1208, 0019,2000,05C0,0800,0000,1209      ;2035     1208:   Q_Q-K[.1]
U 1209, 0019,2000,05C0,0800,0000,120A      ;2036     1209:   Q_Q-K[.1]
U 120A, 0019,2000,05C0,0800,0000,120B      ;2037     120A:   Q_Q-K[.1]
U 120B, 0019,2000,05C0,0800,0000,120C      ;2038     120B:   Q_Q-K[.1]
U 120C, 0019,2000,05C0,0800,0000,120D      ;2039     120C:   Q_Q-K[.1]
U 120D, 0019,2000,05C0,0800,0000,120E      ;2040     120D:   Q_Q-K[.1]
U 120E, 0019,2000,05C0,0800,0000,120F      ;2041     120E:   Q_Q-K[.1]
U 120F, 0019,2000,05C0,0800,0000,1210      ;2042     120F:   Q_Q-K[.1]
U 1210, 0019,2000,05C0,0800,0000,1211      ;2043     1210:   Q_Q-K[.1]
U 1211, 0019,2000,05C0,0800,0000,1212      ;2044     1211:   Q_Q-K[.1]
U 1212, 0019,2000,05C0,0800,0000,1213      ;2045     1212:   Q_Q-K[.1]
U 1213, 0019,2000,05C0,0800,0000,1214      ;2046     1213:   Q_Q-K[.1]
U 1214, 0019,2000,05C0,0800,0000,1215      ;2047     1214:   Q_Q-K[.1]
U 1215, 0019,2000,05C0,0800,0000,1216      ;2048     1215:   Q_Q-K[.1]
U 1216, 0019,2000,05C0,0800,0000,1217      ;2049     1216:   Q_Q-K[.1]
U 1217, 0019,2000,05C0,0800,0000,1218      ;2050     1217:   Q_Q-K[.1]
U 1218, 0019,2000,05C0,0800,0000,1219      ;2051     1218:   Q_Q-K[.1]
U 1219, 0019,2000,05C0,0800,0000,121A      ;2052     1219:   Q_Q-K[.1]
U 121A, 0019,2000,05C0,0800,0000,121B      ;2053     121A:   Q_Q-K[.1]
U 121B, 0019,2000,05C0,0800,0000,121C      ;2054     121B:   Q_Q-K[.1]
U 121C, 0019,2000,05C0,0800,0000,121D      ;2055     121C:   Q_Q-K[.1]
U 121D, 0019,2000,05C0,0800,0000,121E      ;2056     121D:   Q_Q-K[.1]
U 121E, 0019,2000,05C0,0800,0000,121F      ;2057     121E:   Q_Q-K[.1]
U 121F, 0019,2000,05C0,0800,0000,1220      ;2058     121F:   Q_Q-K[.1]
U 1220, 0019,2000,05C0,0800,0000,1221      ;2059     1220:   Q_Q-K[.1]
U 1221, 0019,2000,05C0,0800,0000,1222      ;2060     1221:   Q_Q-K[.1]
U 1222, 0019,2000,05C0,0800,0000,1223      ;2061     1222:   Q_Q-K[.1]
U 1223, 0019,2000,05C0,0800,0000,1224      ;2062     1223:   Q_Q-K[.1]
U 1224, 0019,2000,05C0,0800,0000,1225      ;2063     1224:   Q_Q-K[.1]
U 1225, 0019,2000,05C0,0800,0000,1226      ;2064     1225:   Q_Q-K[.1]
U 1226, 0019,2000,05C0,0800,0000,1227      ;2065     1226:   Q_Q-K[.1]
```

```
U 1227, 0019,2000,05C0,0800,0000,1228   ;2066   1227:   Q_Q-K[.1]
U 1228, 0019,2000,05C0,0800,0000,1229   ;2067   1228:   Q_Q-K[.1]
U 1229, 0019,2000,05C0,0800,0000,122A   ;2068   1229:   Q_Q-K[.1]
U 122A, 0019,2000,05C0,0800,0000,122B   ;2069   122A:   Q_Q-K[.1]
U 122B, 0019,2000,05C0,0800,0000,122C   ;2070   122B:   Q_Q-K[.1]
U 122C, 0019,2000,05C0,0800,0000,122D   ;2071   122C:   Q_Q-K[.1]
U 122D, 0019,2000,05C0,0800,0000,122E   ;2072   122D:   Q_Q-K[.1]
U 122E, 0019,2000,05C0,0800,0000,122F   ;2073   122E:   Q_Q-K[.1]
U 122F, 0019,2000,05C0,0800,0000,1230   ;2074   122F:   Q_Q-K[.1]
U 1230, 0019,2000,05C0,0800,0000,1231   ;2075   1230:   Q_Q-K[.1]
U 1231, 0019,2000,05C0,0800,0000,1232   ;2076   1231:   Q_Q-K[.1]
U 1232, 0019,2000,05C0,0800,0000,1233   ;2077   1232:   Q_Q-K[.1]
U 1233, 0019,2000,05C0,0800,0000,1234   ;2078   1233:   Q_Q-K[.1]
U 1234, 0019,2000,05C0,0800,0000,1235   ;2079   1234:   Q_Q-K[.1]
U 1235, 0019,2000,05C0,0800,0000,1236   ;2080   1235:   Q_Q-K[.1]
U 1236, 0019,2000,05C0,0800,0000,1237   ;2081   1236:   Q_Q-K[.1]
U 1237, 0019,2000,05C0,0800,0000,1238   ;2082   1237:   Q_Q-K[.1]
U 1238, 0019,2000,05C0,0800,0000,1239   ;2083   1238:   Q_Q-K[.1]
U 1239, 0019,2000,05C0,0800,0000,123A   ;2084   1239:   Q_Q-K[.1]
U 123A, 0019,2000,05C0,0800,0000,123B   ;2085   123A:   Q_Q-K[.1]
U 123B, 0019,2000,05C0,0800,0000,123C   ;2086   123B:   Q_Q-K[.1]
U 123C, 0019,2000,05C0,0800,0000,123D   ;2087   123C:   Q_Q-K[.1]
U 123D, 0019,2000,05C0,0800,0000,123E   ;2088   123D:   Q_Q-K[.1]
U 123E, 0019,2000,05C0,0800,0000,123F   ;2089   123E:   Q_Q-K[.1]
U 123F, 0019,2000,05C0,0800,0000,1240   ;2090   123F:   Q_Q-K[.1]
U 1240, 0019,2000,05C0,0800,0000,1241   ;2091   1240:   Q_Q-K[.1]
U 1241, 0019,2000,05C0,0800,0000,1242   ;2092   1241:   Q_Q-K[.1]
U 1242, 0019,2000,05C0,0800,0000,1243   ;2093   1242:   Q_Q-K[.1]
U 1243, 0019,2000,05C0,0800,0000,1244   ;2094   1243:   Q_Q-K[.1]
U 1244, 0019,2000,05C0,0800,0000,1245   ;2095   1244:   Q_Q-K[.1]
U 1245, 0019,2000,05C0,0800,0000,1246   ;2096   1245:   Q_Q-K[.1]
U 1246, 0019,2000,05C0,0800,0000,1247   ;2097   1246:   Q_Q-K[.1]
U 1247, 0019,2000,05C0,0800,0000,1248   ;2098   1247:   Q_Q-K[.1]
U 1248, 0019,2000,05C0,0800,0000,1249   ;2099   1248:   Q_Q-K[.1]
U 1249, 0019,2000,05C0,0800,0000,124A   ;2100   1249:   Q_Q-K[.1]
U 124A, 0019,2000,05C0,0800,0000,124B   ;2101   124A:   Q_Q-K[.1]
U 124B, 0019,2000,05C0,0800,0000,124C   ;2102   124B:   Q_Q-K[.1]
U 124C, 0019,2000,05C0,0800,0000,124D   ;2103   124C:   Q_Q-K[.1]
U 124D, 0019,2000,05C0,0800,0000,124E   ;2104   124D:   Q_Q-K[.1]
U 124E, 0019,2000,05C0,0800,0000,124F   ;2105   124E:   Q_Q-K[.1]
U 124F, 0019,2000,05C0,0800,0000,1250   ;2106   124F:   Q_Q-K[.1]
U 1250, 0019,2000,05C0,0800,0000,1251   ;2107   1250:   Q_Q-K[.1]
U 1251, 0019,2000,05C0,0800,0000,1252   ;2108   1251:   Q_Q-K[.1]
U 1252, 0019,2000,05C0,0800,0000,1253   ;2109   1252:   Q_Q-K[.1]
U 1253, 0019,2000,05C0,0800,0000,1254   ;2110   1253:   Q_Q-K[.1]
U 1254, 0019,2000,05C0,0800,0000,1255   ;2111   1254:   Q_Q-K[.1]
U 1255, 0019,2000,05C0,0800,0000,1256   ;2112   1255:   Q_Q-K[.1]
U 1256, 0019,2000,05C0,0800,0000,1257   ;2113   1256:   Q_Q-K[.1]
U 1257, 0019,2000,05C0,0800,0000,1258   ;2114   1257:   Q_Q-K[.1]
U 1258, 0019,2000,05C0,0800,0000,1259   ;2115   1258:   Q_Q-K[.1]
U 1259, 0019,2000,05C0,0800,0000,125A   ;2116   1259:   Q_Q-K[.1]
U 125A, 0019,2000,05C0,0800,0000,125B   ;2117   125A:   Q_Q-K[.1]
U 125B, 0019,2000,05C0,0800,0000,125C   ;2118   125B:   Q_Q-K[.1]
U 125C, 0019,2000,05C0,0800,0000,125D   ;2119   125C:   Q_Q-K[.1]
U 125D, 0019,2000,05C0,0800,0000,125E   ;2120   125D:   Q_Q-K[.1]
```

```
U 125E, 0019,2000,05C0,0800,0000,125F   ;2121   125E:   Q_Q-K[.1]
U 125F, 0019,2000,05C0,0800,0000,1260   ;2122   125F:   Q_Q-K[.1]
U 1260, 0019,2000,05C0,0800,0000,1261   ;2123   1260:   Q_Q-K[.1]
U 1261, 0019,2000,05C0,0800,0000,1262   ;2124   1261:   Q_Q-K[.1]
U 1262, 0019,2000,05C0,0800,0000,1263   ;2125   1262:   Q_Q-K[.1]
U 1263, 0019,2000,05C0,0800,0000,1264   ;2126   1263:   Q_Q-K[.1]
U 1264, 0019,2000,05C0,0800,0000,1265   ;2127   1264:   Q_Q-K[.1]
U 1265, 0019,2000,05C0,0800,0000,1266   ;2128   1265:   Q_Q-K[.1]
U 1266, 0019,2000,05C0,0800,0000,1267   ;2129   1266:   Q_Q-K[.1]
U 1267, 0019,2000,05C0,0800,0000,1268   ;2130   1267:   Q_Q-K[.1]
U 1268, 0019,2000,05C0,0800,0000,1269   ;2131   1268:   Q_Q-K[.1]
U 1269, 0019,2000,05C0,0800,0000,126A   ;2132   1269:   Q_Q-K[.1]
U 126A, 0019,2000,05C0,0800,0000,126B   ;2133   126A:   Q_Q-K[.1]
U 126B, 0019,2000,05C0,0800,0000,126C   ;2134   126B:   Q_Q-K[.1]
U 126C, 0019,2000,05C0,0800,0000,126D   ;2135   126C:   Q_Q-K[.1]
U 126D, 0019,2000,05C0,0800,0000,126E   ;2136   126D:   Q_Q-K[.1]
U 126E, 0019,2000,05C0,0800,0000,126F   ;2137   126E:   Q_Q-K[.1]
U 126F, 0019,2000,05C0,0800,0000,1270   ;2138   126F:   Q_Q-K[.1]
U 1270, 0019,2000,05C0,0800,0000,1271   ;2139   1270:   Q_Q-K[.1]
U 1271, 0019,2000,05C0,0800,0000,1272   ;2140   1271:   Q_Q-K[.1]
U 1272, 0019,2000,05C0,0800,0000,1273   ;2141   1272:   Q_Q-K[.1]
U 1273, 0019,2000,05C0,0800,0000,1274   ;2142   1273:   Q_Q-K[.1]
U 1274, 0019,2000,05C0,0800,0000,1275   ;2143   1274:   Q_Q-K[.1]
U 1275, 0019,2000,05C0,0800,0000,1276   ;2144   1275:   Q_Q-K[.1]
U 1276, 0019,2000,05C0,0800,0000,1277   ;2145   1276:   Q_Q-K[.1]
U 1277, 0019,2000,05C0,0800,0000,1278   ;2146   1277:   Q_Q-K[.1]
U 1278, 0019,2000,05C0,0800,0000,1279   ;2147   1278:   Q_Q-K[.1]
U 1279, 0019,2000,05C0,0800,0000,127A   ;2148   1279:   Q_Q-K[.1]
U 127A, 0019,2000,05C0,0800,0000,127B   ;2149   127A:   Q_Q-K[.1]
U 127B, 0019,2000,05C0,0800,0000,127C   ;2150   127B:   Q_Q-K[.1]
U 127C, 0019,2000,05C0,0800,0000,127D   ;2151   127C:   Q_Q-K[.1]
U 127D, 0019,2000,05C0,0800,0000,127E   ;2152   127D:   Q_Q-K[.1]
U 127E, 0019,2000,05C0,0800,0000,127F   ;2153   127E:   Q_Q-K[.1]
U 127F, 0019,2000,05C0,0800,0000,1280   ;2154   127F:   Q_Q-K[.1]
U 1280, 0019,2000,05C0,0800,0000,1281   ;2155   1280:   Q_Q-K[.1]
U 1281, 0019,2000,05C0,0800,0000,1282   ;2156   1281:   Q_Q-K[.1]
U 1282, 0019,2000,05C0,0800,0000,1283   ;2157   1282:   Q_Q-K[.1]
U 1283, 0019,2000,05C0,0800,0000,1284   ;2158   1283:   Q_Q-K[.1]
U 1284, 0019,2000,05C0,0800,0000,1285   ;2159   1284:   Q_Q-K[.1]
U 1285, 0019,2000,05C0,0800,0000,1286   ;2160   1285:   Q_Q-K[.1]
U 1286, 0019,2000,05C0,0800,0000,1287   ;2161   1286:   Q_Q-K[.1]
U 1287, 0019,2000,05C0,0800,0000,1288   ;2162   1287:   Q_Q-K[.1]
U 1288, 0019,2000,05C0,0800,0000,1289   ;2163   1288:   Q_Q-K[.1]
U 1289, 0019,2000,05C0,0800,0000,128A   ;2164   1289:   Q_Q-K[.1]
U 128A, 0019,2000,05C0,0800,0000,128B   ;2165   128A:   Q_Q-K[.1]
U 128B, 0019,2000,05C0,0800,0000,128C   ;2166   128B:   Q_Q-K[.1]
U 128C, 0019,2000,05C0,0800,0000,128D   ;2167   128C:   Q_Q-K[.1]
U 128D, 0019,2000,05C0,0800,0000,128E   ;2168   128D:   Q_Q-K[.1]
U 128E, 0019,2000,05C0,0800,0000,128F   ;2169   128E:   Q_Q-K[.1]
U 128F, 0019,2000,05C0,0800,0000,1290   ;2170   128F:   Q_Q-K[.1]
U 1290, 0019,2000,05C0,0800,0000,1291   ;2171   1290:   Q_Q-K[.1]
U 1291, 0019,2000,05C0,0800,0000,1292   ;2172   1291:   Q_Q-K[.1]
U 1292, 0019,2000,05C0,0800,0000,1293   ;2173   1292:   Q_Q-K[.1]
U 1293, 0019,2000,05C0,0800,0000,1294   ;2174   1293:   Q_Q-K[.1]
U 1294, 0019,2000,05C0,0800,0000,1295   ;2175   1294:   Q_Q-K[.1]
```

```
U 1295, 0019,2000,05C0,0800,0000,1296   ;2176   1295:   Q_Q-K[.1]
U 1296, 0019,2000,05C0,0800,0000,1297   ;2177   1296:   Q_Q-K[.1]
U 1297, 0019,2000,05C0,0800,0000,1298   ;2178   1297:   Q_Q-K[.1]
U 1298, 0019,2000,05C0,0800,0000,1299   ;2179   1298:   Q_Q-K[.1]
U 1299, 0019,2000,05C0,0800,0000,129A   ;2180   1299:   Q_Q-K[.1]
U 129A, 0019,2000,05C0,0800,0000,129B   ;2181   129A:   Q_Q-K[.1]
U 129B, 0019,2000,05C0,0800,0000,129C   ;2182   129B:   Q_Q-K[.1]
U 129C, 0019,2000,05C0,0800,0000,129D   ;2183   129C:   Q_Q-K[.1]
U 129D, 0019,2000,05C0,0800,0000,129E   ;2184   129D:   Q_Q-K[.1]
U 129E, 0019,2000,05C0,0800,0000,129F   ;2185   129E:   Q_Q-K[.1]
U 129F, 0019,2000,05C0,0800,0000,12A0   ;2186   129F:   Q_Q-K[.1]
U 12A0, 0019,2000,05C0,0800,0000,12A1   ;2187   12A0:   Q_Q-K[.1]
U 12A1, 0019,2000,05C0,0800,0000,12A2   ;2188   12A1:   Q_Q-K[.1]
U 12A2, 0019,2000,05C0,0800,0000,12A3   ;2189   12A2:   Q_Q-K[.1]
U 12A3, 0019,2000,05C0,0800,0000,12A4   ;2190   12A3:   Q_Q-K[.1]
U 12A4, 0019,2000,05C0,0800,0000,12A5   ;2191   12A4:   Q_Q-K[.1]
U 12A5, 0019,2000,05C0,0800,0000,12A6   ;2192   12A5:   Q_Q-K[.1]
U 12A6, 0019,2000,05C0,0800,0000,12A7   ;2193   12A6:   Q_Q-K[.1]
U 12A7, 0019,2000,05C0,0800,0000,12A8   ;2194   12A7:   Q_Q-K[.1]
U 12A8, 0019,2000,05C0,0800,0000,12A9   ;2195   12A8:   Q_Q-K[.1]
U 12A9, 0019,2000,05C0,0800,0000,12AA   ;2196   12A9:   Q_Q-K[.1]
U 12AA, 0019,2000,05C0,0800,0000,1155   ;2197   12AA:   Q_Q-K[.1]                       ; GETS ECO'D TO 1155
U 1155, 0019,2000,05C0,0800,0000,12AB   ;2198   1155:   Q_Q-K[.1],J/12AB
                                        ;2199
U 12AB, 0019,2000,05C0,0800,0000,12AC   ;2200   12AB:   Q_Q-K[.1]
U 12AC, 0019,2000,05C0,0800,0000,12AD   ;2201   12AC:   Q_Q-K[.1]
U 12AD, 0019,2000,05C0,0800,0000,12AE   ;2202   12AD:   Q_Q-K[.1]
U 12AE, 0019,2000,05C0,0800,0000,12AF   ;2203   12AE:   Q_Q-K[.1]
U 12AF, 0019,2000,05C0,0800,0000,12B0   ;2204   12AF:   Q_Q-K[.1]
U 12B0, 0019,2000,05C0,0800,0000,12B1   ;2205   12B0:   Q_Q-K[.1]
U 12B1, 0019,2000,05C0,0800,0000,12B2   ;2206   12B1:   Q_Q-K[.1]
U 12B2, 0019,2000,05C0,0800,0000,12B3   ;2207   12B2:   Q_Q-K[.1]
U 12B3, 0019,2000,05C0,0800,0000,12B4   ;2208   12B3:   Q_Q-K[.1]
U 12B4, 0019,2000,05C0,0800,0000,12B5   ;2209   12B4:   Q_Q-K[.1]
U 12B5, 0019,2000,05C0,0800,0000,12B6   ;2210   12B5:   Q_Q-K[.1]
U 12B6, 0019,2000,05C0,0800,0000,12B7   ;2211   12B6:   Q_Q-K[.1]
U 12B7, 0019,2000,05C0,0800,0000,12B8   ;2212   12B7:   Q_Q-K[.1]
U 12B8, 0019,2000,05C0,0800,0000,12B9   ;2213   12B8:   Q_Q-K[.1]
U 12B9, 0019,2000,05C0,0800,0000,12BA   ;2214   12B9:   Q_Q-K[.1]
U 12BA, 0019,2000,05C0,0800,0000,12BB   ;2215   12BA:   Q_Q-K[.1]
U 12BB, 0019,2000,05C0,0800,0000,12BC   ;2216   12BB:   Q_Q-K[.1]
U 12BC, 0019,2000,05C0,0800,0000,12BD   ;2217   12BC:   Q_Q-K[.1]
U 12BD, 0019,2000,05C0,0800,0000,12BE   ;2218   12BD:   Q_Q-K[.1]
U 12BE, 0019,2000,05C0,0800,0000,12BF   ;2219   12BE:   Q_Q-K[.1]
U 12BF, 0019,2000,05C0,0800,0000,12C0   ;2220   12BF:   Q_Q-K[.1]
U 12C0, 0019,2000,05C0,0800,0000,12C1   ;2221   12C0:   Q_Q-K[.1]
U 12C1, 0019,2000,05C0,0800,0000,12C2   ;2222   12C1:   Q_Q-K[.1]
U 12C2, 0019,2000,05C0,0800,0000,12C3   ;2223   12C2:   Q_Q-K[.1]
U 12C3, 0019,2000,05C0,0800,0000,12C4   ;2224   12C3:   Q_Q-K[.1]
U 12C4, 0019,2000,05C0,0800,0000,12C5   ;2225   12C4:   Q_Q-K[.1]
U 12C5, 0019,2000,05C0,0800,0000,12C6   ;2226   12C5:   Q_Q-K[.1]
U 12C6, 0019,2000,05C0,0800,0000,12C7   ;2227   12C6:   Q_Q-K[.1]
U 12C7, 0019,2000,05C0,0800,0000,12C8   ;2228   12C7:   Q_Q-K[.1]
U 12C8, 0019,2000,05C0,0800,0000,12C9   ;2229   12C8:   Q_Q-K[.1]
U 12C9, 0019,2000,05C0,0800,0000,12CA   ;2230   12C9:   Q_Q-K[.1]
```

```
U 12CA, 0019,2000,05C0,0800,0000,12CB    ;2231    12CA:    Q_Q-K[.1]
U 12CB, 0019,2000,05C0,0800,0000,12CC    ;2232    12CB:    Q_Q-K[.1]
U 12CC, 0019,2000,05C0,0800,0000,12CD    ;2233    12CC:    Q_Q-K[.1]
U 12CD, 0019,2000,05C0,0800,0000,12CE    ;2234    12CD:    Q_Q-K[.1]
U 12CE, 0019,2000,05C0,0800,0000,12CF    ;2235    12CE:    Q_Q-K[.1]
U 12CF, 0019,2000,05C0,0800,0000,12D0    ;2236    12CF:    Q_Q-K[.1]
U 12D0, 0019,2000,05C0,0800,0000,12D1    ;2237    12D0:    Q_Q-K[.1]
U 12D1, 0019,2000,05C0,0800,0000,12D2    ;2238    12D1:    Q_Q-K[.1]
U 12D2, 0019,2000,05C0,0800,0000,12D3    ;2239    12D2:    Q_Q-K[.1]
U 12D3, 0019,2000,05C0,0800,0000,12D4    ;2240    12D3:    Q_Q-K[.1]
U 12D4, 0019,2000,05C0,0800,0000,12D5    ;2241    12D4:    Q_Q-K[.1]
U 12D5, 0019,2000,05C0,0800,0000,12D6    ;2242    12D5:    Q_Q-K[.1]
U 12D6, 0019,2000,05C0,0800,0000,12D7    ;2243    12D6:    Q_Q-K[.1]
U 12D7, 0019,2000,05C0,0800,0000,12D8    ;2244    12D7:    Q_Q-K[.1]
U 12D8, 0019,2000,05C0,0800,0000,12D9    ;2245    12D8:    Q_Q-K[.1]
U 12D9, 0019,2000,05C0,0800,0000,12DA    ;2246    12D9:    Q_Q-K[.1]
U 12DA, 0019,2000,05C0,0800,0000,12DB    ;2247    12DA:    Q_Q-K[.1]
U 12DB, 0019,2000,05C0,0800,0000,12DC    ;2248    12DB:    Q_Q-K[.1]
U 12DC, 0019,2000,05C0,0800,0000,12DD    ;2249    12DC:    Q_Q-K[.1]
U 12DD, 0019,2000,05C0,0800,0000,12DE    ;2250    12DD:    Q_Q-K[.1]
U 12DE, 0019,2000,05C0,0800,0000,12DF    ;2251    12DE:    Q_Q-K[.1]
U 12DF, 0019,2000,05C0,0800,0000,12E0    ;2252    12DF:    Q_Q-K[.1]
U 12E0, 0019,2000,05C0,0800,0000,12E1    ;2253    12E0:    Q_Q-K[.1]
U 12E1, 0019,2000,05C0,0800,0000,12E2    ;2254    12E1:    Q_Q-K[.1]
U 12E2, 0019,2000,05C0,0800,0000,12E3    ;2255    12E2:    Q_Q-K[.1]
U 12E3, 0019,2000,05C0,0800,0000,12E4    ;2256    12E3:    Q_Q-K[.1]
U 12E4, 0019,2000,05C0,0800,0000,12E5    ;2257    12E4:    Q_Q-K[.1]
U 12E5, 0019,2000,05C0,0800,0000,12E6    ;2258    12E5:    Q_Q-K[.1]
U 12E6, 0019,2000,05C0,0800,0000,12E7    ;2259    12E6:    Q_Q-K[.1]
U 12E7, 0019,2000,05C0,0800,0000,12E8    ;2260    12E7:    Q_Q-K[.1]
U 12E8, 0019,2000,05C0,0800,0000,12E9    ;2261    12E8:    Q_Q-K[.1]
U 12E9, 0019,2000,05C0,0800,0000,12EA    ;2262    12E9:    Q_Q-K[.1]
U 12EA, 0019,2000,05C0,0800,0000,12EB    ;2263    12EA:    Q_Q-K[.1]
U 12EB, 0019,2000,05C0,0800,0000,12EC    ;2264    12EB:    Q_Q-K[.1]
U 12EC, 0019,2000,05C0,0800,0000,12ED    ;2265    12EC:    Q_Q-K[.1]
U 12ED, 0019,2000,05C0,0800,0000,12EE    ;2266    12ED:    Q_Q-K[.1]
U 12EE, 0019,2000,05C0,0800,0000,12EF    ;2267    12EE:    Q_Q-K[.1]
U 12EF, 0019,2000,05C0,0800,0000,12F0    ;2268    12EF:    Q_Q-K[.1]
U 12F0, 0019,2000,05C0,0800,0000,12F1    ;2269    12F0:    Q_Q-K[.1]
U 12F1, 0019,2000,05C0,0800,0000,12F2    ;2270    12F1:    Q_Q-K[.1]
U 12F2, 0019,2000,05C0,0800,0000,12F3    ;2271    12F2:    Q_Q-K[.1]
U 12F3, 0019,2000,05C0,0800,0000,12F4    ;2272    12F3:    Q_Q-K[.1]
U 12F4, 0019,2000,05C0,0800,0000,12F5    ;2273    12F4:    Q_Q-K[.1]
U 12F5, 0019,2000,05C0,0800,0000,12F6    ;2274    12F5:    Q_Q-K[.1]
U 12F6, 0019,2000,05C0,0800,0000,12F7    ;2275    12F6:    Q_Q-K[.1]
U 12F7, 0019,2000,05C0,0800,0000,12F8    ;2276    12F7:    Q_Q-K[.1]
U 12F8, 0019,2000,05C0,0800,0000,12F9    ;2277    12F8:    Q_Q-K[.1]
U 12F9, 0019,2000,05C0,0800,0000,12FA    ;2278    12F9:    Q_Q-K[.1]
U 12FA, 0019,2000,05C0,0800,0000,12FB    ;2279    12FA:    Q_Q-K[.1]
U 12FB, 0019,2000,05C0,0800,0000,12FC    ;2280    12FB:    Q_Q-K[.1]
U 12FC, 0019,2000,05C0,0800,0000,12FD    ;2281    12FC:    Q_Q-K[.1]
U 12FD, 0019,2000,05C0,0800,0000,12FE    ;2282    12FD:    Q_Q-K[.1]
U 12FE, 0019,2000,05C0,0800,0000,12FF    ;2283    12FE:    Q_Q-K[.1]
U 12FF, 0019,2002,05C0,0800,0000,0001    ;2284    12FF:    Q_Q-K[.1],RETURN1
                                         ;2285
```

```
                                              ;+
                                              ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
                                              ; CACHE REFERANCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
                                              ; IS COMPLETELY FULL OF DATA.
                                              ;
                                              ; BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
                                              ;-

U 1313, 3000,003C,0180,6000,0000,1314         IBWAIT: LOAD.IB,IBC/START
U 1314, 0000,003C,0180,F800,0000,1315         SYNC02: MCT/ALLOW.IB.READ
U 1315, 0000,003C,0180,F800,0000,1316                 MCT/ALLOW.IB.READ
U 1316, 0000,003C,0180,F800,0000,1317                 MCT/ALLOW.IB.READ
U 1317, 0000,003C,0180,F800,0000,1318                 MCT/ALLOW.IB.READ
U 1318, 0000,003C,0180,F800,0000,1319                 MCT/ALLOW.IB.READ
U 1319, 1000,003E,0180,F800,0000,0001                 MCT/ALLOW.IB.READ,IBC/STOP,RETURN1
```

```
                                          .PAGE   "TEST 110       INSTRUCTION BUFFER STALL"
                                          ;**********************************************************************
                                          ;++
                                          ; TEST  110     INSTRUCTION BUFFER STALL
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS TEST FLUSHES THE INSTRUCTION BUFFER, (IT DOES NOT START IT,
                                          ;       SO ALL BYTES WILL REMAIN INVALID), AND EXECUTES THE SPECIFIER
                                          ;       SUBROUTINE CALL. SINCE THE STALL SIGNAL ON IRC SHOULD BE ASCERTED,
                                          ;       THE SERVICE BITS FROM THE ICL MODULE AND THE OTHER BITS FROM THE
                                          ;       IRC MODULE SHOULD CAUSE ADDRESS 7E TO BE ASCERTED.
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;       THIS TEST CHECKS THAT THE SERVICE BIT MULTIPLEXOR ON THE ICL
                                          ;       MODULE IS DISABLED, AND THAT THE STALL+SVC SIGNAL AND UPC MULTIPLEXOR
                                          ;       ON THE IRC MODULE ARE ENABLED.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       DATA: EXPECTED MICRO PC BITS<7:0>
                                          ;             RECEIVED MICRO PC BITS<7:0>
                                          ;
                                          ; SYNC POINT DESCRIPTION
                                          ;       ADDRESS SYNC00 - UPC FROM INSTRUCTION BUFFER IS ENABLED
                                          ;       ADDRESS SYNC01 - INSTRUCTION BUFFER FLUSHES
                                          ;--
                                          ;**********************************************************************
                                          =0
U 1008, 0000,003D,0180,0800,0000,11DF     T110:   NEWTST
U 1009, 0000,003C,0180,0800,0000,100A             NOP
U 100A, 0F00,003D,0180,0800,0000,11FF     =0      D_0,CALL,J/DC7                  ; GENERATE THE EXPECTED VALUE
U 100B, 0018,0038,0980,09F8,0000,100C             RC[OF]_K[.2]                    ; TWO ARGUMENTS
U 100C, 0000,003D,0180,0800,0000,1306     =0      CALL,J7DCE                      ; IN THE D REG
U 100D, 0001,003C,0180,09F0,0000,1010             RC[OE]_D                        ; SAVE FOR TYPEOUT
                                          
                                          =0
                                          ;//////////////////////////////////////////////////////////////////////
                                          ;+
                                          ; START THE TEST
                                          ;-
                                          
U 1010, 0000,003D,0180,0800,0000,11F3     T110S1: ERLOOP
U 1011, 1810,0038,0180,0970,0000,131A             D_RC[OE],IBC/STOP               ; RELOAD D REG
U 131A, 2018,0038,1980,0800,4200,1012     SYNC01: A[U_0(K),FLUSH.IB               ; LOAD ADDRESS 0 AND INIT  IBUFF
U 1012, 0000,003D,0180,0800,0000,1312     =0      CAL[,J/DISPAT                   ; EXECUTE THE CALL
U 1013, 001D,A000,0180,0800,0010,131B             ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE RESULT
U 131B, 0000,013C,0180,0800,0000,1014             Z?                              ; BRANCH IF OK
U 1014, 0001,203D,0180,09E8,0000,11F4     =0      ERROR1,RC[OD]_Q                 ; RD[D] CONTAINS ERROR ADDRESS
U 1015, 0000,003C,0180,0800,0000,1016             NOP
```

```
                                            .PAGE   "TEST 111        A FORK TEST OF OPCODE 00 THRU 05 AND OPCODE FF"
                                            ;*********************************************************************
                                            ;++
                                            ; TEST  111     A FORK TEST OF OPCODE 00 THRU 05 AND OPCODE FF
                                            ;
                                            ; TEST DESCRIPTION
                                            ;       SUBTST 1 - LOAD BYTE 0 OF THE INSTRUCTION BUFFER WITH THE OPCODES
                                            ;                  OF 00,01,02,03,04, AND 05 AND EXECUTE THE SUB/SPEC FUNCTION
                                            ;                  TO CHECK THAT THESE OPCODES ARE DOCODED PROPERLY.
                                            ;                  THE EXPECTED ADDRESS STARTS AT 8F (FOR OPCODE 00) AND
                                            ;                  IS DECREMENTED EACH TIME THRU THE LOOP.
                                            ;       SUBTST 2 - LOAD BYTE 0 OF THE INSTRUCTION BUFFER WITH FF AND
                                            ;                  EXECUTE THE SUB/SPEC FUNCTION TO CHECK THAT AN OPCODE
                                            ;                  OF FF IS DECODED CORRECTLY.
                                            ;
                                            ; LOGIC DESCRIPTION
                                            ;       BOTH SUBTESTS USE THE CONTENTS OF THE VAX DECODE ROMS, THE
                                            ;       "DECODE ADDRESS" GATES, AND THE UPC MULTIPLEXOR ON IRC. IMPLICITLY
                                            ;       CHECKED IS BYTE 0 OF THE BYTE SHIFTER ON IDP, AND
                                            ;       THE BYTE 0 LATCH ON IRC.
                                            ;
                                            ; ERROR DESCRIPTION
                                            ;       EXPECTED MICRO PC BITS<7:0>
                                            ;       RECEIVED MICRO PC BITS<7:0>
                                            ;       LOOP COUNT OF SUBTST 1--STARTS AT 6
                                            ;
                                            ; SYNC POINT DESCRIPTION
                                            ;       ADDRESS SYNC02 - BYTE ZERO GETS LATCHED FROM THE CACHE
                                            ;       ADDRESS SYNC00 - IB ADDRESS IS ENABLED ONTO UPC LINES
                                            ;--
                                            ;*********************************************************************
                                            =0
U 1016, 0000,003D,0180,0800,0000,11DF       T111:   NEWTST
U 1017, 0018,8038,0D80,09F8,0000,1018               RC[0F]_K[.3],BYTE               ; TWO ARGUMENTS FOR TYPEOUT
U 1018, 0818,0039,0180,0800,0000,1307       =0      D_K[.8],CALL,J/DCF              ; GENERATE DISPAT ADR FOR OPCODE 00
U 1019, 0001,003C,0180,09F0,0000,101A               RC[0E]_D                        ; SAVE
U 101A, 0818,0039,0180,0800,0000,11FB       =0      D_K[.8],CALL,J/DC3              ; GEN DISPAT ADR FOR OPCODE FF
U 101B, 0001,003C,0180,0A80,0000,131C               R[0]_D                          ; SAVE
U 131C, 0003,003C,0180,0A88,0000,101C               R[1]_0                          ; SET ADDRESS OF IB DATA

                                            ;/////////////////////////////////////////////////////////////////////
                                            ;+
                                            ; FIRST CHECK OPCODE 00 THRU OPCODE 05
                                            ;-

                                            =0
U 101C, 0000,003D,0180,0800,0000,130D       T111S1: SUBTEST
U 101D, 0018,0038,D580,09E0,0000,1020               RC[0C]_K[.6]                    ; SET THE LOOP COUNT
U 1020, 0000,003D,0180,0800,0000,11F3       =0      ERLOOP
U 1021, 0810,0038,0180,0970,0000,1022       T111L1: D_RC[0E]                        ; PUT EXPECTED ADDRESS IN D REGISTER
U 1022, 2000,003D,0180,0A08,4200,1313       =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1023, 0000,003C,0180,0800,0000,1024               NOP
U 1024, 0000,003D,0180,0800,0000,1312       =0      CALL,J/DISPAT                   ; EXECUTE THE A FORK
U 1025, 001D,A000,0180,0800,0010,131D               ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 131D, 0000,013C,0180,0800,0000,1026               Z?
```

```
U 1026, 0001,203D,0180,09E8,0000,11F6   ;2411   =0      ERROR2,RC[OD]_Q                 ; OPCODE 00 FAILED
U 1027, 0800,003C,0180,0A08,0000,131E   ;2412           D_R[1]                          ; GET ADDRESS OF IB DATA
U 131E, 0019,0014,1180,0A88,0000,131F   ;2413           R[1]_D+K[.4]                    ; INCREMENT TO NEXT OP CODE
U 131F, 0810,0038,0180,0970,0000,1320   ;2414           D_RC[OE]                        ; GET CURRENT EXPECTED ADDRESS
U 1320, 0019,0000,0580,09F0,0000,1321   ;2415           RC[OE]_D-K[.1]                  ; DECREMENT TO NEXT EXPECTED ADDRESS
U 1321, 0810,0038,0180,0960,0000,1322   ;2416           D_RC[OC]                        ; GET THE LOOP COUNT
U 1322, 0019,8000,0580,09E0,0010,1323   ;2417           RC[OC]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT AND CHECK
U 1323, 0000,013C,0180,0800,0000,1028   ;2418           Z?
U 1028, 0000,003C,0180,0800,0000,1021   ;2419   =0      J/T111L1                        ; CONTINUE
                                        ;2420
                                        ;2421   ;//////////////////////////////////////////////////////////////////////
                                        ;2422   ;+
                                        ;2423   ; NOW CHECK OPCODE FF
                                        ;2424   ;-
                                        ;2425
U 1029, 0000,003C,0180,0A00,0000,102A   ;2426   T111S2: LAB_R[0]
U 102A, 0000,003D,0180,0800,0000,130D   ;2427   =0      SUBTEST
U 102B, 0000,003C,0180,09F0,0000,102C   ;2428           RC[OE]_LA                       ; GET EXPECTED ADDRESS
U 102C, 0000,003D,0180,0800,0000,11F3   ;2429   =0      ERLOOP
U 102D, 0810,0038,0180,0970,0000,1030   ;2430           D_RC[OE]                        ; GET EXPECTED ADDRESS
U 1030, 2000,003D,0180,0A08,4200,1313   ;2431   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1031, 0000,003C,0180,0800,0000,1032   ;2432           NOP
U 1032, 0000,003D,0180,0800,0000,1312   ;2433   =0      CALL,J/DISPAT                   ; EXECUTE THE A FORK
U 1033, 001D,A000,0180,0800,0010,1324   ;2434           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 1324, 0000,013C,0180,0800,0000,1034   ;2435           Z?
U 1034, 0001,203D,0180,09E8,0000,11F6   ;2436   =0      ERROR2,RC[OD]_Q                 ; OPCODE FF FAILED
U 1035, 0000,003C,0180,0800,0000,1036   ;2437           NOP
                                        ;2438
                                        ;2439
                                        ;2440   ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2441   ;% 0
                                        ;2442   ; SUBTST 1
                                        ;2443   ;$ 0000,0000
                                        ;2444   ;$ 0101,0101
                                        ;2445   ;$ 0202,0202
                                        ;2446   ;$ 0303,0303
                                        ;2447   ;$ 0404,0404
                                        ;2448   ;$ 0505,0505
                                        ;2449   ;
                                        ;2450   ; SUBTST 2
                                        ;2451   ;$ FFFF,FFFF
                                        ;2452
                                        ;2453
```

```
                                      .PAGE   "TEST 112       BYTE 0 SHIFT CONTROL"
                                      ;******************************************************************************
                                      ;++
                                      ; TEST  112     BYTE 0 SHIFT CONTROL
                                      ;
                                      ; TEST DESCRIPTION
                                      ;       THIS TEST CHECKS THE SELECT LINES OF THE
                                      ;       SHIFTER ON BYTE 0. THIS IS DONE BY
                                      ;       LOADING ALL BYTES OF THE IB WITH AN OPCODE OF FF EXCEPT THE BYTE
                                      ;       THAT WILL GET SHIFTED INTO BYTE 0 WHICH GETS LOADED WITH AN
                                      ;       OPCODE OF 00.
                                      ;
                                      ;       SUBTST 1 - CHECK FOR NO SHIFT WHILE EXECUTING A START FUNCTION
                                      ;       SUBTST 2 - CHECK FOR NO SHIFT WHILE EXECUTING A CLR BYTE 1 FUNCTION
                                      ;       SUBTST 3 - CHECK FOR NO SHIFT WHILE EXECUTING A CLR BYTE 2,3 FUNCTION
                                      ;       SUBTST 4 - CHECK FOR NO SHIFT WHILE EXECUTING A CLR BYTES 1-5 CONDITIONAL
                                      ;                  FUNCTION.
                                      ;       SUBTST 5 - CHECK THAT BYTE 0 GETS BYTE 1 WHEN EXECUTING A CLR
                                      ;                  BYTE 0 FUNCTION.
                                      ;       SUBTST 6 - CHECK THAT BYTE 0 GETS BYTE 2 WHEN EXECUTING A CLR
                                      ;                  BYTE 0,1 FUNCTION.
                                      ;       SUBTST 7 - CHECK THAT BYTE 0 GETS BYTE 4 WHEN EXECUTING A CLR
                                      ;                  BYTE 0-3 FUNCTION.
                                      ;
                                      ; ERROR DESCRIPTION
                                      ;       EXPECTED MICRO PC BITS <7:0>
                                      ;       RECEIVED MICRO PC BITS <7:0>
                                      ;
                                      ; SYNC POINT DESCRIPTION
                                      ;       ADDRESS SYNC00 - IB ADDRESS IS ENABLED ONTO THE UPC LINES AT THE
                                      ;                        INSTRUCTION AFTER THIS INSTRUCTION.
                                      ;       SUBTST 1 - SYNC03--START FUNCTION IS EXECUTED
                                      ;       SUBTST 2 - SYNC04--CLR BYTE 1 FUNCTION IS EXECUTED
                                      ;       SUBTST 3 - SYNC05--CLR BYTE 2,3 FUNCTION IS EXECUTED
                                      ;       SUBTST 4 - SYNC06--CLR BYTES 1-5 CONDITIONAL FUNCTION IS EXECUTED
                                      ;       SUBTST 5 - SYNC07--CLR BYTE 0 FUNCTION IS EXECUTED
                                      ;       SUBTST 6 - SYNC08--CLR BYTES 0,1 FUNCTION IS EXECUTED
                                      ;       SUBTST 7 - SYNC09--CLR BYTES 0-3 FUNCTION IS EXECUTED
                                      ;--
                                      ;******************************************************************************

                                      =0
U 1036, 0018,0039,0980,09F8,0000,11DF T112:   NEWTST[.2]
U 1037, 0018,0038,7580,0A88,0000,1038         R[1]_K[.20]                     ; SET ADDRESS OF IB DATA
U 1038, 0818,0039,0580,0800,0000,1304 =0      D_K[.1],CALL,J/DCC              ; GENERATE ADDRESS OF EXPECTED DATA
U 1039, 0001,003C,0180,0A80,0000,103A         R[0]_D                          ; SAVE IN R0

                                      ;//////////////////////////////////////////////////////////////////////////////
                                      ;+
                                      ; BYTE 0 NO SHIFT---START FUNCTION
                                      ;-

                                      =0
U 103A, 0000,003D,0180,0800,0000,130D T112S1: SUBTEST
U 103B, 0000,003C,0180,0A00,0200,1325         VA_R[0]                         ; LOAD ADDRESS OF EXP DATA
```

```
U 1325, 0000,803C,0180,C800,0000,1326   ;2509            D[BYTE]_CACHE.P                   ; READ THE EXPECTED DATA
U 1326, 0019,0034,4980,09F0,0000,103C   ;2510            RC[0E]_D.AND.K[.FF]               ; SAVE IN RC[E]
U 103C, 0000,003D,0180,0800,0000,11F3   ;2511    =0      ERLOOP
U 103D, 0810,0038,0180,0970,0000,1040   ;2512            D_RC[0E]                          ; RESTORE D REG
U 1040, 2000,003D,0180,0A08,4200,1313   ;2513    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT   ; FETCH THE OP CODE
U 1041, 1000,003C,0180,0800,0000,1042   ;2514            IBC7STOP
                                        ;2515    =0
U 1042, 3000,003D,0180,0800,0000,1312   ;2516    SYNC03: IBC/START,CALL,J/DISPAT           ; EXECUTE THE TEST FUNCTION
U 1043, 1000,003C,0180,0800,0000,1327   ;2517            IBC/STOP
U 1327, 001D,A000,0180,0800,0010,1328   ;2518            ALU_Q-D,CLK.UBCC,BYTE             ; CHECK THE ADDRESS
U 1328, 0000,013C,0180,0800,0000,1044   ;2519            Z?                                ; BRANCH IF OK
U 1044, 0001,A03D,0180,09E8,0000,11F6   ;2520    =0      ERROR2,RC[0D]_Q,BYTE              ;
U 1045, 0000,003C,0180,0800,0000,1046   ;2521            NOP
                                        ;2522
                                        ;2523    ;//////////////////////////////////////////////////////////////////////
                                        ;2524    ;+
                                        ;2525    ; BYTE 0 NO SHIFT---CLR.1 FUNCTION
                                        ;2526    ;-
                                        ;2527
U 1046, 0000,003D,0180,0800,0000,130D   ;2528    =0      SUBTEST
U 1047, 0000,003C,0180,0800,0000,1048   ;2529            NOP
                                        ;2530    =0
U 1048, 0000,003D,0180,0800,0000,11F3   ;2531    T112S2: ERLOOP
U 1049, 0810,0038,0180,0970,0000,104A   ;2532            D_RC[0E]                          ; GET EXPECTED ADDRESS
U 104A, 2000,003D,0180,0A08,4200,1313   ;2533    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT   ; LOAD THE OP CODE
U 104B, 1000,003C,0180,0800,0000,104C   ;2534            IBC7STOP
                                        ;2535    =0
U 104C, D000,003D,0180,0800,0000,1312   ;2536    SYNC04: IBC/CLR.1,CALL,J/DISPAT           ; EXECUTE THE TEST FUNCTION
U 104D, 001D,A000,0180,0800,0010,1329   ;2537            ALU_Q-D,CLK.UBCC,BYTE             ; CHECK THE RESULT
U 1329, 0000,013C,0180,0800,0000,1050   ;2538            Z?                                ; BRANCH IF OK
U 1050, 0001,A03D,0180,09E8,0000,11F6   ;2539    =0      ERROR2,RC[0D]_Q,BYTE              ;
U 1051, 0000,003C,0180,0800,0000,1052   ;2540            NOP
                                        ;2541
                                        ;2542    ;//////////////////////////////////////////////////////////////////////
                                        ;2543    ;+
                                        ;2544    ; BYTE 0 NO SHIFT---CLEAR 2,3 FUNCTION
                                        ;2545    ;-
                                        ;2546
U 1052, 0000,003D,0180,0800,0000,130D   ;2547    =0      SUBTEST
U 1053, 0000,003C,0180,0800,0000,1054   ;2548            NOP
                                        ;2549    =0
U 1054, 0000,003D,0180,0800,0000,11F3   ;2550    T112S3: ERLOOP
U 1055, 0810,0038,0180,0970,0000,1056   ;2551            D_RC[0E]                          ; GET EXPECTED DATA
U 1056, 2000,003D,0180,0A08,4200,1313   ;2552    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT   ; LOAD THE OP CODE
U 1057, 1000,003C,0180,0800,0000,1058   ;2553            IBC7STOP
                                        ;2554    =0
U 1058, 5000,003D,0180,0800,0000,1312   ;2555    SYNC05: IBC/CLR.2.3,CALL,J/DISPAT         ; EXECUTE THE TEST FUNCTION
U 1059, 001D,A000,0180,0800,0010,132A   ;2556            ALU_Q-D,CLK.UBCC,BYTE             ; ADDRESS OK?
U 132A, 0000,013C,0180,0800,0000,105C   ;2557            Z?                                ; BRANCH IF OK
U 105C, 0001,A03D,0180,09E8,0000,11F6   ;2558    =0      ERROR2,RC[0D]_Q,BYTE              ;
U 105D, 0000,003C,0180,0800,0000,1060   ;2559            NOP
                                        ;2560
                                        ;2561
                                        ;2562    ;//////////////////////////////////////////////////////////////////////
                                        ;2563    ;+
                                          ;2564    ; BYTE 0 NO SHIFT---CLEAR.1-5.COND FUNCTION
                                          ;2565    ;-
                                          ;2566
U 1060, 0000,003D,0180,0800,0000,130D     ;2567    =0       SUBTEST
U 1061, 0000,003C,0180,0800,0000,1062     ;2568             NOP
                                          ;2569    =0
U 1062, 0000,003D,0180,0800,0000,11F3     ;2570    T112S4: ERLOOP
U 1063, 0810,0038,0180,0970,0000,1064     ;2571            D_RC[OE]                         ; GET EXPECTED DATA
U 1064, 2000,003D,0180,0A08,4200,1313     ;2572    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE OP CODE
U 1065, 1000,003C,0180,0800,0000,1066     ;2573            IBC7STOP
                                          ;2574    =0
U 1066, F000,003D,0180,0800,0000,1312     ;2575    SYNC06: IBC/CLR.1-5.COND,CALL,J/DISPAT   ; EXECUTE THE TEST INSTRUCTION
U 1067, 001D,A000,0180,0800,0010,132B     ;2576            ALU_Q-D,CLK.UBCC,BYTE            ; ADDRESS OK?
U 132B, 0000,013C,0180,0800,0000,1068     ;2577            Z?                               ; BRANCH IF OK
U 1068, 0001,A03D,0180,09E8,0000,11F6     ;2578    =0      ERROR2,RC[OD]_Q,BYTE             ;
                                          ;2579
                                          ;2580    ;///////////////////////////////////////////////////////////////////////
                                          ;2581    ;+
                                          ;2582    ; BYTE 0 ONE SHIFT---CLR.0 FUNCTION
                                          ;2583    ;-
                                          ;2584
U 1069, 0000,003C,0180,0A08,0000,106A     ;2585    T112S5: LAB_R[1]
U 106A, 0000,003D,0180,0800,0000,130D     ;2586    =0      SUBTEST
U 106B, 0018,0014,0180,0A88,0000,1070     ;2587            R[1]_LA+K[.8]                    ; SELECT ADDRESS OF NEXT OP CODE
U 1070, 0000,003D,0180,0800,0000,11F3     ;2588    =0      ERLOOP
U 1071, 0810,0038,0180,0970,0000,1072     ;2589            D_RC[OE]                         ; GET EXPECTED ADDRESS
U 1072, 2000,003D,0180,0A08,4200,1313     ;2590    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE OP CODE
U 1073, 1000,003C,0180,0800,0000,1074     ;2591            IBC7STOP
                                          ;2592    =0
U 1074, C000,003D,0180,0800,0000,1312     ;2593    SYNC07: IBC/CLR.0,CALL,J/DISPAT          ; EXECUTE THE TEST INSTRUCTION
U 1075, 001D,A000,0180,0800,0010,132C     ;2594            ALU_Q-D,CLK.UBCC,BYTE            ; ADDRESS OK?
U 132C, 0000,013C,0180,0800,0000,1076     ;2595            Z?                               ; BRANCH IF OK
U 1076, 0001,A03D,0180,09E8,0000,11F6     ;2596    =0      ERROR2,RC[OD]_Q,BYTE             ;
                                          ;2597
                                          ;2598    ;///////////////////////////////////////////////////////////////////////
                                          ;2599    ;+
                                          ;2600    ; BYTE 0 TWO SHIFT---CLR.0.1 FUNCTION
                                          ;2601    ;-
                                          ;2602
U 1077, 0000,003C,0180,0A08,0000,1078     ;2603    T112S6: LAB_R[1]                         ; GEN ADDRESS OF OP CODE
U 1078, 0000,003D,0180,0800,0000,130D     ;2604    =0      SUBTEST
U 1079, 0018,0014,0180,0A88,0000,107A     ;2605            R[1]_LA+K[.8]                    ; ...
U 107A, 0000,003D,0180,0800,0000,11F3     ;2606    =0      ERLOOP
U 107B, 0810,0038,0180,0970,0000,1080     ;2607            D_RC[OE]                         ; GET EXPECTED DATA
U 1080, 2000,003D,0180,0A08,4200,1313     ;2608    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE OP CODE
U 1081, 1000,003C,0180,0800,0000,1082     ;2609            IBC7STOP
                                          ;2610    =0
U 1082, 4000,003D,0180,0800,0000,1312     ;2611    SYNC08: IBC/CLR.0.1,CALL,J/DISPAT        ; EXECUTE THE FUNCTION
U 1083, 001D,A000,0180,0800,0010,132D     ;2612            ALU_Q-D,CLK.UBCC,BYTE            ; ADDRESS OK?
U 132D, 0000,013C,0180,0800,0000,1084     ;2613            Z?                               ; BRANCH IF OK
U 1084, 0001,A03D,0180,09E8,0000,11F6     ;2614    =0      ERROR2,RC[OD]_Q,BYTE             ;
                                          ;2615
                                          ;2616    ;///////////////////////////////////////////////////////////////////////
                                          ;2617    ;+
                                          ;2618    ; BYTE 0 FOUR SHIFT---CLR.0-3 FUNCTION
```

```
                                              ;-

U 1085, 0000,003C,0180,0A08,0000,1086         T112S7: LAB_R[1]                         ; GEN ADDRESS OF OP CODE
U 1086, 0000,003D,0180,0800,0000,130D         =0      SUBTEST
U 1087, 0018,0014,0180,0A88,0000,1088                 R[1]_LA+K[.8]                    ; ...
U 1088, 0000,003D,0180,0800,0000,11F3         =0      ERLOOP
U 1089, 0810,0038,0180,0970,0000,108A                 D_RC[0E]                         ; GET EXPECTED ADDRESS
U 108A, 2000,003D,0180,0A08,4200,1313         =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE OP CODE
U 108B, 1000,003C,0180,0800,0000,108C                 IBC7STOP
                                              =0
U 108C, E000,003D,0180,0800,0000,1312         SYNC09: IBC/CLR.0-3,CALL,J/DISPAT        ; EXECUTE THE FUNCTION
U 108D, 001D,A000,0180,0800,0010,132E                 ALU_Q-D,CLK.UBCC,BYTE            ; ADDRESS OK?
U 132E, 0000,013C,0180,0800,0000,108E                 Z?                               ; BRANCH IF OK
U 108E, 0001,A03D,0180,09E8,0000,11F6         =0      ERROR2,RC[0D]_Q,BYTE             ;
U 108F, 0000,003C,0180,0800,0000,1090                 NOP

                                              ;+
                                              ; FOLLOWING IS THE EXPECTED DISPATCH ADDRESS FOR THE ABOVE TEST:
                                              ;-

                                              ;% 1C
                                              ;$ 8F
                                              ;+
                                              ; FOLLOWING ARE THE OP CODES FOR THE ABOVE TEST:
                                              ;-

                                              ;% 20
                                              ; SUBTESTS 1,2,3, AND 4
                                              ;$ 4000,FFFF,FFFF,FFFF
                                              ;
                                              ; SUBTEST 5
                                              ;$ 00FF,FFFF,FFFF,FFFF
                                              ;
                                              ; SUBTEST 6
                                              ;$ FFFF,FF00,FFFF,FFFF
                                              ;
                                              ; SUBTEST 7
                                              ;$ FFFF,FFFF,FF00,FFFF

```

```
                                        ;2659   .PAGE   ''TEST 113         BYTE 1 SHIFT CONTROL''
                                        ;2660   ;**********************************************************************
                                        ;2661   ;++
                                        ;2662   ; TEST  113     BYTE 1 SHIFT CONTROL
                                        ;2663   ;
                                        ;2664   ; TEST DESCRIPTION
                                        ;2665   ;       THIS TEST CHECKS THE SHIFTER SELECT LOGIC FOR BYTE 1 BY LOADING
                                        ;2666   ;       THE IB WITH A DATA PATTERN, EXECUTING A FUNCTION, AND THEN CHECKING
                                        ;2667   ;       THAT BYTE 1 RECEIVED THE CORRECT DATA. THE DATA PATTERNS THAT ARE
                                        ;2668   ;       LOADED INTO THE IB ARE SELECTED TO CREATE SPECIFIC CONDITIONS OF THE
                                        ;2669   ;       SIGNALS THAT GENERATE THE SHIFTER SELECTS. EACH SUBTST HEADER
                                        ;2670   ;       DESCRIBES THE EXPECTED STATE OF THESE SIGNALS.
                                        ;2671   ;
                                        ;2672   ;       SUBTST 1 - CHECK BYTE 1 DOSEN'T SHIFT WITH A CLR 1-5 CONDITIONAL
                                        ;2673   ;                  FUNCTION AND THE ''SAVE'' SIGNAL IS ASCERTED.
                                        ;2674   ;       SUBTST 2 - CHECK BYTE 1 DOSEN'T SHIFT WITH A CLR 1-5 CONDITIONAL
                                        ;2675   ;                  FUNCTION AND ''DELTA PC 2'' IS ASCERTED.
                                        ;2676   ;       SUBTST 3 - CHECK BYTE 1 DOSEN'T SHIFT WITH A CLR 1-5 CONDITIONAL
                                        ;2677   ;                  FUNCTION AND PC 1 EN B ACTIVE.
                                        ;2678   ;       SUBTST 4 - CHECK BYTE 1 DOSEN'T SHIFT WITH A CLR 1-5 CONDITIONAL
                                        ;2679   ;                  FUNCTION AND ''PC 1 EN A'' IS ASCERTED.
                                        ;2680   ;       SUBTST 5 - CHECK BYTE 1 GETS BYTE 2 WITH A CLR BYTE 0 FUNCTION.
                                        ;2681   ;       SUBTST 6 - CHECK BYTE 1 GETS BYTE 2 WITH A CLR BYTE 1 FUNCTION.
                                        ;2682   ;       SUBTST 7 - CHECK BYTE 1 GETS BYTE 2 WITH A CLR BYTE 1-5 CONDITIONAL
                                        ;2683   ;                  FUNCTION.
                                        ;2684   ;       SUBTST 8 - CHECK BYTE 1 GETS BYTE 3 WITH A CLR BYTE 0,1 FUNCTION.
                                        ;2685   ;       SUBTST 9 - CHECK BYTE 1 GETS BYTE 5 WITH A CLR BYTE 0-3 FUNCTION.
                                        ;2686   ;
                                        ;2687   ; LOGIC DESCRIPTION
                                        ;2688   ;       THIS TEST CHECKS THE LOGIC ON IDP THAT GENERATES THE SELECT
                                        ;2689   ;       SIGNALS FOR THE BYTE SHIFTERS. IT ALSO CHECKS THE LOGIC THAT
                                        ;2690   ;       DECODES THE IB CONTROL FIELD AND ''DELTA PC'' SIGNALS ON IDP.
                                        ;2691   ;
                                        ;2692   ; ERROR DESCRIPTION
                                        ;2693   ;       DATA: EXPECTED UPC BITS<7:0> FROM THE IB
                                        ;2694   ;             RECEIVED UPC BITS<7:0> FROM THE IB
                                        ;2695   ;
                                        ;2696   ; SYNC POINT DESCRIPTION
                                        ;2697   ;       ADDRESS SYNC00 - INSTRUCTION THAT EXECUTES THE SUB/SPEC FUNCTION
                                        ;2698   ;       SUBTST 1 - SYNC10--CLR 1-5 CONDITIONAL AND SAVE IS ASCERTED
                                        ;2699   ;       SUBTST 2 - SYNC11--CLR 1-5 CONDITIONAL AND AND DELTA PC 2 IS ASCERTED
                                        ;2700   ;       SUBTST 3 - SYNC12--CLR 1-5 CONDITIONAL AND PC 1 EN B IS ASCERTED
                                        ;2701   ;       SUBTST 4 - SYNC13--CLR 1-5 CONDITIONAL AND PC 1 EN A IS ASCERTED
                                        ;2702   ;       SUBTST 5 - SYNC14--CLR BYTE 0 FUNCTION IS ENABLED
                                        ;2703   ;       SUBTST 6 - SYNC15--CLR BYTE 1 FUNCTION IS ENABLED
                                        ;2704   ;       SUBTST 7 - SYNC16--CLR BYTE 1-5 CONDITIONAL FUNCTION ENABLED
                                        ;2705   ;       SUBTST 8 - SYNC17--CLR BYTE 0,1 FUNCTION ENABLED
                                        ;2706   ;       SUBTST 9 - SYNC18--CLR BYTE 1-3 FUNCTION ENABLED
                                        ;2707   ;--
                                        ;2708   ;**********************************************************************
                                        ;2709
                                        ;2710   =0
U 1090, 0018,0039,0980,09F8,0000,11DF   ;2711   T113:   NEWTST[.2]
U 1091, 0818,0038,3180,0A80,0000,132F   ;2712           R[0]_K[.40],D_ALU               ; SET ADDRESS OF EXPECTED DATA
U 132F, 0019,0014,1180,0A88,0000,1092   ;2713           R[1]_D+K[.4]                    ; AND ADDRESS OF OP CODES
```

```
                                          ;2714
                                          ;2715   ;//////////////////////////////////////////////////////////////////////
                                          ;2716   ;+
                                          ;2717   ; BYTE 1 NO SHIFT---CLR.1-5.COND*SAVE FUNCTION
                                          ;2718   ;-
                                          ;2719
                                          ;2720   =0
U 1092, 0000,003D,0180,0800,0000,130D     ;2721   T113S1: SUBTEST
U 1093, 0000,003C,0180,0A00,0200,1330     ;2722           VA_R[0]                           ; LOAD ADDRESS OF EXPECTED DATA
U 1330, 0000,803C,0180,C800,0000,1331     ;2723           D[BYTE]_CACHE.P                   ; GET EXPECTED DATA
U 1331, 0019,0034,4980,09F0,0000,1094     ;2724           RC[0E]_D.AND.K[.FF]               ; SAVE IN RC[E]
U 1094, 0000,003D,0180,0800,0000,11F3     ;2725   =0      ERLOOP
U 1095, 0810,0038,0180,0970,0000,1096     ;2726           D_RC[0E]                          ; GET EXPECTED ADDRESS
U 1096, 2000,003D,0180,0A08,4200,1313     ;2727   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 1097, F000,003C,0180,0800,0000,1098     ;2728   SYNC10: IBC7CLR.1-5.COND                  ; EXECUTE THE TEST INSTRUCTION
U 1098, C000,003D,0180,0800,0000,1312     ;2729   =0      IBC/CLR.0,CALL,J/DISPAT           ; DO A CALL 3 ON BYTE 1
U 1099, 001D,A000,0180,0800,0010,1332     ;2730           ALU_Q-D,CLK.UBCC,BYTE             ; ADDRESS OK?
U 1332, 0000,013C,0180,0800,0000,109A     ;2731           Z?                                ; BRANCH IF OK
U 109A, 0001,A03D,0180,09E8,0000,11F6     ;2732   =0      ERROR2,RC[0D]_Q,BYTE              ;
                                          ;2733
                                          ;2734   ;//////////////////////////////////////////////////////////////////////
                                          ;2735   ;+
                                          ;2736   ; BYTE 1 NO SHIFT---CLR.1-5.COND*DELTA PC 2*-PC 1 EN A*-PC 1 EN B FUNCTION
                                          ;2737   ;-
                                          ;2738
U 109B, 0000,003C,0180,0A08,0000,109C     ;2739   T113S2: LAB_R[1]                          ; INCREMENT OP CODE ADDRESS
U 109C, 0000,003D,0180,0800,0000,130D     ;2740   =0      SUBTEST
U 109D, 0018,0014,0180,0A88,0000,1333     ;2741           R[1]_LA+K[.8]                     ; ...
U 1333, 0000,003C,0180,0A00,0000,1334     ;2742           LAB_R[0]                          ; AND ADDRESS OF EXPECTED DATA
U 1334, 0018,0014,0580,0A80,0000,1335     ;2743           R[0]_LA+K[.1]                     ; ...
                                          ;2744
U 1335, 0000,003C,0180,0A00,0200,1336     ;2745           VA_R[0]                           ; LOAD ADDRESS OF EXP DATA
U 1336, 0000,803C,0180,C800,0000,1337     ;2746           D[BYTE]_CACHE.P                   ; READ EXPECTED DATA
U 1337, 0019,0034,4980,09F0,0000,109E     ;2747           RC[0E]_D.AND.K[.FF]               ; SAVE
U 109E, 0000,003D,0180,0800,0000,11F3     ;2748   =0      ERLOOP
U 109F, 0810,0038,0180,0970,0000,10A0     ;2749           D_RC[0E]                          ; PUT EXPECTED DATA IN D REG
U 10A0, 2000,003D,0180,0A08,4200,1313     ;2750   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD OP CODE
U 10A1, F000,003C,0180,0800,0000,10A2     ;2751   SYNC11: IBC7CLR.1-5.COND                  ; EXECUTE TEST FUNCTION
U 10A2, C000,003D,0180,0800,0000,1312     ;2752   =0      IBC/CLR.0,CALL,J/DISPAT           ; DO CALL 3 ON BYTE 1
U 10A3, 001D,A000,0180,0800,0010,1338     ;2753           ALU_Q-D,CLK.UBCC,BYTE             ; ADDRESS OK?
U 1338, 0000,013C,0180,0800,0000,10A4     ;2754           Z?                                ; BRANCH IF OK
U 10A4, 0001,A03D,0180,09E8,0000,11F6     ;2755   =0      ERROR2,RC[0D]_Q,BYTE              ;
                                          ;2756
                                          ;2757   ;//////////////////////////////////////////////////////////////////////
                                          ;2758   ;+
                                          ;2759   ; BYTE 1 NO SHIFT---CLR.1-5.COND*-DELTA PC 2*-PC 1 EN A*PC 1 EN B
                                          ;2760   ;-
                                          ;2761
U 10A5, 0000,003C,0180,0A08,0000,10A6     ;2762   T113S3: LAB_R[1]                          ; INCREMENT ADDRESS OF OP CODE
U 10A6, 0000,003D,0180,0800,0000,130D     ;2763   =0      SUBTEST
U 10A7, 0018,0014,0180,0A88,0000,10A8     ;2764           R[1]_LA+K[.8]                     ; ...
                                          ;2765
U 10A8, 0000,003D,0180,0800,0000,11F3     ;2766   =0      ERLOOP
U 10A9, 0810,0038,0180,0970,0000,10AA     ;2767           D_RC[0E]                          ; GET EXPECTED ADDRESS
U 10AA, 2000,003D,0180,0A08,4200,1313     ;2768   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
```

```
U 10AB, F000,003C,0180,0800,0000,10AC   ;2769   SYNC12: IBC/CLR.1-5.COND              ; EXECUTE THE TEST FUNCTION
U 10AC, C000,003D,0180,0800,0000,1312   ;2770   =0      IBC/CLR.0,CALL,J/DISPAT       ; DO A CALL 3 ON BYTE 1
U 10AD, 001D,A000,0180,0800,0010,1339   ;2771           ALU_Q-D,CLK.UBCC,BYTE         ; ADDRESS OK?
U 1339, 0000,013C,0180,0800,0000,10AE   ;2772           Z?                            ; BRANCH IF OK
U 10AE, 0001,A03D,0180,09E8,0000,11F6   ;2773   =0      ERROR2,RC[OD]_Q,BYTE          ;
                                        ;2774
                                        ;2775   ;//////////////////////////////////////////////////////////////////////
                                        ;2776   ;+
                                        ;2777   ; BYTE 1 NO SHIFT---CLR.1-5.COND*-DELTA PC 2*PC 1 EN A*-PC 1 EN B
                                        ;2778   ;-
                                        ;2779
U 10AF, 0000,003C,0180,0A08,0000,10B0   ;2780   T113S4: LAB_R[1]                      ; INCREMENT ADDRESS OF OP CODES
U 10B0, 0000,003D,0180,0800,0000,130D   ;2781   =0      SUBTEST
U 10B1, 0018,0014,0180,0A88,0000,10B2   ;2782           R[1]_LA+K[.8]                 ; ...
U 10B2, 0000,003D,0180,0800,0000,11F3   ;2783   =0      ERLOOP
U 10B3, 0810,0038,0180,0970,0000,10B4   ;2784           D_RC[OE]                      ; GET EXPECTED ADDRESS
U 10B4, 2000,003D,0180,0A08,4200,1313   ;2785   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 10B5, F000,003C,0180,0800,0000,10B6   ;2786   SYNC13: IBC/CLR.1-5.COND              ; EXECUTE THE TEST FUNCTION
U 10B6, C000,003D,0180,0800,0000,1312   ;2787   =0      IBC/CLR.0,CALL,J/DISPAT       ; DO CALL 3 ON BYTE 1
U 10B7, 001D,A000,0180,0800,0010,133A   ;2788           ALU_Q-D,CLK.UBCC,BYTE         ; ADDRESS OK?
U 133A, 0000,013C,0180,0800,0000,10B8   ;2789           Z?                            ; BRANCH IF OK
U 10B8, 0001,A03D,0180,09E8,0000,11F6   ;2790   =0      ERROR2,RC[OD]_Q,BYTE          ;
                                        ;2791
                                        ;2792   ;//////////////////////////////////////////////////////////////////////
                                        ;2793   ;+
                                        ;2794   ; BYTE 1 ONE SHIFT---CLR.0 FUNCTION
                                        ;2795   ;-
                                        ;2796
U 10B9, 0000,003C,0180,0A00,0000,10BA   ;2797   T113S5: LAB_R[0]                      ; INCREMENT ADDRESS OF EXPECTED DATA
U 10BA, 0000,003D,0180,0800,0000,130D   ;2798   =0      SUBTEST
U 10BB, 0018,0014,0580,0A80,0000,133B   ;2799           R[0]_LA+K[.1]                 ; ...
U 133B, 0000,003C,0180,0A08,0000,133C   ;2800           LAB_R[1]                      ; INCREMENT ADDRESS OF OP CODE
U 133C, 0018,0014,0180,0A88,0000,133D   ;2801           R[1]_LA+K[.8]                 ; ...
                                        ;2802
U 133D, 0000,003C,0180,0A00,0200,133E   ;2803           VA_R[0]                       ; LOAD ADDRESS OF EXPECTED DATA
U 133E, 0000,803C,0180,C800,0000,133F   ;2804           D[BYTE]_CACHE.P               ; READ THE EXPECTED DATA
U 133F, 0019,0034,4980,09F0,0000,10BC   ;2805           RC[OE]_D.AND.K[.FF]           ; SAVE
U 10BC, 0000,003D,0180,0800,0000,11F3   ;2806   =0      ERLOOP
U 10BD, 0810,0038,0180,0970,0000,10BE   ;2807           D_RC[OE]                      ; GET EXPECTED DATA
U 10BE, 2000,003D,0180,0A08,4200,1313   ;2808   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 10BF, C000,003C,0180,0800,0000,10C0   ;2809   SYNC14: IBC/CLR.0                     ; EXECUTE THE TEST INSTRUCTION
U 10C0, C000,003D,0180,0800,0000,1312   ;2810   =0      IBC/CLR.0,CALL,J/DISPAT       ; DO A CALL 3 ON BYTE 1
U 10C1, 001D,A000,0180,0800,0010,1340   ;2811           ALU_Q-D,CLK.UBCC,BYTE         ; ADDRESS OK?
U 1340, 0000,013C,0180,0800,0000,10C2   ;2812           Z?                            ; BRANCH IF OK
U 10C2, 0001,A03D,0180,09E8,0000,11F6   ;2813   =0      ERROR2,RC[OD]_Q,BYTE          ;
U 10C3, 0000,003C,0180,0800,0000,10C4   ;2814           NOP
                                        ;2815
                                        ;2816   ;//////////////////////////////////////////////////////////////////////
                                        ;2817   ;+
                                        ;2818   ; BYTE 1 ONE SHIFT---CLR.1 FUNCTION
                                        ;2819   ;-
                                        ;2820
U 10C4, 0000,003D,0180,0800,0000,130D   ;2821   =0      SUBTEST
U 10C5, 0000,003C,0180,0800,0000,10C6   ;2822           NOP
                                        ;2823   =0
```

```
U 10C6, 0000,003D,0180,0800,0000,11F3   ;2824   T113S6: ERLOOP
U 10C7, 0810,0038,0180,0970,0000,10C8   ;2825           D_RC[OE]                        ; GET EXPECTED DATA
U 10C8, 2000,003D,0180,0A08,4200,1313   ;2826   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 10C9, D000,003C,0180,0800,0000,10CA   ;2827   SYNC15: IBC7CLR.1                       ; EXECUTE THE TEST INSTRUCTION
U 10CA, C000,003D,0180,0800,0000,1312   ;2828   =0      IBC/CLR.0,CALL,J/DISPAT         ; DO A CALL 3 ON BYTE 1
U 10CB, 001D,A000,0180,0800,0010,1341   ;2829           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 1341, 0000,013C,0180,0800,0000,10CC   ;2830           Z?                              ; BRANCH IF OK
U 10CC, 0001,A03D,0180,09E8,0000,11F6   ;2831   =0      ERROR2,RC[OD]_Q,BYTE            ;
                                        ;2832
                                        ;2833   ;///////////////////////////////////////////////////////////////////
                                        ;2834   ;+
                                        ;2835   ; BYTE 1 ONE SHIFT---CLR.1-5.COND FUNCTION
                                        ;2836   ;-
                                        ;2837
U 10CD, 0000,003C,0180,0A08,0000,10CE   ;2838   T113S7: LAB_R[1]                        ; INCREMENT ADDRESS OF OP CODE
U 10CE, 0000,003D,0180,0800,0000,130D   ;2839   =0      SUBTEST
U 10CF, 0018,0014,0180,0A88,0000,10D0   ;2840           R[1]_LA+K[.8]                   ; ...
U 10D0, 0000,003D,0180,0800,0000,11F3   ;2841   =0      ERLOOP
U 10D1, 0810,0038,0180,0970,0000,10D2   ;2842           D_RC[OE]                        ; GET EXPECTED DATA
U 10D2, 2000,003D,0180,0A08,4200,1313   ;2843   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 10D3, F000,003C,0180,0800,0000,1342   ;2844   SYNC16: IBC7CLR.1-5.COND                ; EXECUTE THE TEST INSTRUCTION
U 1342, C000,003C,0180,0800,0000,10D4   ;2845           IBC/CLR.0                       ; SHIFT OVER TO THE HALT INSTRUCTION
U 10D4, C000,003D,0180,0800,0000,1312   ;2846   =0      IBC/CLR.0,CALL,J/DISPAT         ; DO A CALL 3 ON BYTE 1
U 10D5, 001D,A000,0180,0800,0010,1343   ;2847           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 1343, 0000,013C,0180,0800,0000,10D6   ;2848           Z?                              ; BRANCH IF OK
U 10D6, 0001,A03D,0180,09E8,0000,11F6   ;2849   =0      ERROR2,RC[OD]_Q,BYTE            ;
U 10D7, 0000,003C,0180,0800,0000,10D8   ;2850           NOP
                                        ;2851
                                        ;2852   ;///////////////////////////////////////////////////////////////////
                                        ;2853   ;+
                                        ;2854   ; BYTE 1 TWO SHIFT---CLR.0.1 FUNCTION
                                        ;2855   ;-
                                        ;2856
U 10D8, 0000,003D,0180,0800,0000,130D   ;2857   =0      SUBTEST
U 10D9, 0000,003C,0180,0800,0000,10DA   ;2858           NOP
                                        ;2859   =0
U 10DA, 0000,003D,0180,0800,0000,11F3   ;2860   T113S8: ERLOOP
U 10DB, 0810,0038,0180,0970,0000,10DC   ;2861           D_RC[OE]                        ; GET EXPECTED DATA
U 10DC, 2000,003D,0180,0A08,4200,1313   ;2862   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 10DD, 4000,003C,0180,0800,0000,10DE   ;2863   SYNC17: IBC7CLR.0.1                     ; EXECUTE THE TEST INSTRUCTION
U 10DE, C000,003D,0180,0800,0000,1312   ;2864   =0      IBC/CLR.0,CALL,J/DISPAT         ; DO A CALL 3 ON BYTE 1
U 10DF, 001D,A000,0180,0800,0010,1344   ;2865           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 1344, 0000,013C,0180,0800,0000,10E0   ;2866           Z?                              ; BRANCH IF OK
U 10E0, 0001,A03D,0180,09E8,0000,11F6   ;2867   =0      ERROR2,RC[OD]_Q,BYTE            ;
                                        ;2868
                                        ;2869   ;///////////////////////////////////////////////////////////////////
                                        ;2870   ;+
                                        ;2871   ; BYTE 1 FOUR SHIFT---CLR.0-3 FUNCTION
                                        ;2872   ;-
                                        ;2873
U 10E1, 0000,003C,0180,0A08,0000,10E2   ;2874   T113S9: LAB_R[1]                        ; INCREMENT OP CODE ADDRESS
U 10E2, 0000,003D,0180,0800,0000,130D   ;2875   =0      SUBTEST
U 10E3, 0018,0014,0180,0A88,0000,10E4   ;2876           R[1]_LA+K[.8]                   ; ...
U 10E4, 0000,003D,0180,0800,0000,11F3   ;2877   =0      ERLOOP
U 10E5, 0810,0038,0180,0970,0000,10E6   ;2878           D_RC[OE]                        ; GET EXPECTED DATA
```

```
U 10E6, 2000,003D,0180,0A08,4200,1313   ;2879  =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 10E7, E000,003C,0180,0800,0000,10E8   ;2880  SYNC18: IBC7CLR.0-3                     ; EXECUTE THE TEST INSTRUCTION
U 10E8, C000,003D,0180,0800,0000,1312   ;2881  =0      IBC/CLR.0,CALL,J/DISPAT         ; DO A CALL 3 ON BYTE 1
U 10E9, 001D,A000,0180,0800,0010,1345   ;2882          ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 1345, 0000,013C,0180,0800,0000,10EA   ;2883          Z?                              ; BRANCH IF OK
U 10EA, 0001,A03D,0180,09E8,0000,11F6   ;2884  =0      ERROR2,RC[OD]_Q,BYTE            ;
U 10EB, 0000,003C,0180,0800,0000,10EC   ;2885          NOP
                                        ;2886
                                        ;2887  ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                        ;2888  ;% 40
                                        ;2889  ;
                                        ;2890  ; RIGHT HAND BYTE IS FOR SUBTST 1, LEFT HAND BYTE IS USED FOR SUBTSTS 2,3, AND 4
                                        ;2891  ;$ 088F
                                        ;2892  ;
                                        ;2893  ; RIGHT HAND BYTE IS USED FOR SUBTST 5
                                        ;2894  ;$ 008F
                                        ;2895  ;
                                        ;2896  ; THE FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:
                                        ;2897  ;% 44
                                        ;2898  ; SUBTST 1
                                        ;2899  ;$ 0000,FFFF,FFFF,FFFF
                                        ;2900  ; SUBTST 2
                                        ;2901  ;$ 9FD0,FF60,FFFF,0060
                                        ;2902  ; SUBTST 3
                                        ;2903  ;$ 8F90,60FF,0000,0000
                                        ;2904  ; SUBTST 4
                                        ;2905  ;$ A090,6060,FFFF,0050
                                        ;2906  ; SUBTST 5 AND 6
                                        ;2907  ;$ FFFF,FF00,FFFF,FFFF
                                        ;2908  ; SUBTST 7 AND 8
                                        ;2909  ;$ 60D0,0050,FFFF,FFFF
                                        ;2910  ; SUBTST 9
                                        ;2911  ;$ FFFF,FFFF,00FF,FFFF
                                        ;2912
```

```
.PAGE   "TEST 114       BYTE 2-6 SHIFT CONTROL"
;*************************************************************************
;++
; TEST  114     BYTE 2-6 SHIFT CONTROL
;
; TEST DESCRIPTION
;       THIS TEST CHECKS THE SHIFTER SELECT LOGIC BY LOADING THE IB
;       WITH A DATA PATTERN, EXECUTING A FUNCTION, AND THEN CHECKING
;       THAT BYTES 2-6 RECEIVED THE CORRECT DATA. THE DATA PATTERNS
;       THAT ARE LOADED INTO THE IB ARE SELECTED TO CREATE SPECIFIC
;       CONDITIONS OF THE SIGNALS THAT GENERATE THE SHIFTER SELECTS.
;       EACH SUBTEST HEADER DESCRIBES THE EXPECTED STATE OF THESE SIGNALS.
;
;       SUBTST 1 - START FUNCTION AND THE CLR BYTE 0 FUNCTION
;       SUBTST 2 - BYTE 2-6 NO SHIFT WITH A CLR BYTE 1-5 CONDITIONAL
;                  FUNCTION AND SAVE ASCERTED.
;       SUBTST 3 - BYTE 2-6 GETS BYTES 3-7 WITH A CLR BYTE 1 FUNCTION
;       SUBTST 4 - BYTES 2-6 GET BYTES 3-7 WITH A CLR BYTES 1-5 CONDITIONAL
;                  FUNCTION AND "DELTA PC 1" DISABLED.
;       SUBTST 5 - BYTES 2-6 GET BYTES 3-7 WITH A CLR BYTES 1-5 CONDITIONAL
;                  FUNCTION WITH "DELTA PC 0" ENABLED.
;       SUBTST 6 - BYTES 2-6 GET BYTES 4-7 WITH A CLR BYTES 0,1 FUNCTION
;       SUBTST 7 - BYTES 2-6 GET BYTES 4-7 WITH A CLR BYTES 2,3 FUNCTION
;       SUBTST 8 - BYTES 2-6 GET BYTES 4-7 WITH A CLR BYTES 1-5 CONDITIONAL
;                  FUNCTION AND "DELTA PC 0,1, AND 2" ENABLED.
;       SUBTST 9 - BYTES 2-6 GET BYTES 4-7 WITH A CLR BYTES 1-5 CONDITIONAL
;                  FUNCTION AND "DELTA PC 0,1 AND PC 1 EN A" ENABLED.
;       SUBTST A - BYTES 2-6 GET BYTES 4-7 WITH A CLR BYTES 1-5 CONDITIONAL
;                  FUNCTION AND "DELTA PC 0,1 AND PC 1 EN B" ENABLED.
;       SUBTST B - BYTES 2-6 GET BYTES 6-7 WITH A CLR 0-3 FUNCTION.
;       SUBTST C - BYTES 2-6 GET BYTES 6-7 WITH A CLR BYTES 1-5 CONDITIONAL
;                  FUNCTION WITH "DELTA PC 0 AND 2" ENABLED.
;
; LOGIC DESCRIPTION
;       THIS TEST CHECKS THE LOGIC ON IDP THAT GENERATE THE DELTA PC
;       SIGNALS AND THE PC EN A &B SIGNALS, AND THE LOGIC THAT
;       GENERATES THE SHIFTER SELECT FOR BYTES 2 THRU 6.
;
; ERROR DESCRIPTION
;       EXPECTED MICRO PC BITS <7:0>
;       RECEIVED MICRO PC BITS <7:0>
;       LOOP COUNT- INDICATES WHICH BYTE FAILED. I.E. 6 = BYTE 2,
;                   5 = BYTE 3, 4 = BYTE 4, 3 = BYTE 5, 2 = BYTE 6,
;                   AND 1 = BYTE 7
;
; SYNC POINT DESCRIPTION
;       ADDRESS SYNC00--INSTRUCTION WHERE THE SUB/SPEC IS EXECUTED.
;       SUBTST 1 - SYNC19--START FUNCTION EXECUTED
;       SUBTST 1 - SYNC20--CLR BYTE 0 FUNCTION EXECUTED
;       SUBTST 2 - SYNC21--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
;       SUBTST 3 - SYNC22--CLR BYTE 1 FUNCTION EXECUTED
;       SUBTST 4 - SYNC23--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
;       SUBTST 5 - SYNC24--CLR BYTES 1-5 CONDITIONALD FUNCTION EXECUTED
;       SUBTST 6 - SYNC25--CLR BYTES 0,1 FUNCTION EXECUTED
;       SUBTST 7 - SYNC26--CLR BYTES 2,3 FUNCTION EXECUTED
```

```
                                      ;2968   ;       SUBTST 8 - SYNC27--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
                                      ;2969   ;       SUBTST 9 - SYNC28--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
                                      ;2970   ;       SUBTST 10- SYNC29--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
                                      ;2971   ;       SUBTST 11- SYNC30--CLR BYTES 0-3 FUNCTION EXECUTED
                                      ;2972   ;       SUBTST 12- SYNC31--CLR BYTES 1-5 CONDITIONAL FUNCTION EXECUTED
                                      ;2973   ;--
                                      ;2974   ;**********************************************************************
                                      ;2975
                                      ;2976   =0
U 10EC, 0018,0039,0D80,09F8,0000,11DF ;2977   T114:   NEWTST[.3]
U 10ED, 0818,0038,4180,0A80,0000,1346 ;2978           R[0]_K[.80],D_ALU               ; SET ADDRESS OF EXPECTED DATA
U 1346, 0019,0014,1180,0A88,0000,10EE ;2979           R[1]_D+K[.4]                    ; GET ADDRESS OF OP CODES
                                      ;2980
                                      ;2981   ;////////////////////////////////////////////////////////////////////
                                      ;2982   ;+
                                      ;2983   ; BYTE 2-6 NO SHIFT---START FUNCTION AND ONE SHIFT---CLR.0 FUNCTION
                                      ;2984   ;-
                                      ;2985
                                      ;2986   =0
U 10EE, 0000,003D,0180,0800,0000,130D ;2987   T114S1: SUBTEST
U 10EF, 0000,003C,0180,0800,0000,10F0 ;2988           NOP
U 10F0, 0000,003D,0180,0800,0000,11F3 ;2989   =0      ERLOOP
U 10F1, 0000,003C,0180,0A00,0200,1347 ;2990           VA_R[0]                         ; LOAD ADDRESS OF EXPECTED DATA
U 1347, 0000,803C,0180,C800,0000,1348 ;2991           D[BYTE]_CACHE.P                 ; READ EXPECTED DATA
U 1348, 0019,0034,4980,09F0,0000,1349 ;2992           RC[0E]_D.AND.K[.FF]             ; SAVE
U 1349, 0018,0038,D580,09E0,0000,10F2 ;2993           RC[0C]_K[.6]
U 10F2, 2000,003D,0180,0A08,4200,1313 ;2994   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 10F3, 3000,003C,0180,0800,0000,134A ;2995   SYNC19: IBC/START                       ; EXECUTE THE TEST INSTRUCTION
U 134A, 1000,003C,0180,0800,0000,134B ;2996           IBC/STOP
U 134B, C000,003C,0180,0800,0000,134C ;2997           IBC/CLR.0                       ; SHIFT BYTE 2 TO BYTE 1
U 134C, 0810,0038,0180,0970,0000,10F4 ;2998   T114L1: D_RC[0E]                        ; PUT EXPECTED ADR IN D REG
                                      ;2999   =0
U 10F4, C000,003D,0180,0800,0000,1312 ;3000   SYNC20: IBC/CLR.0,CALL,J/DISPAT         ; SHIFT BYTE 1 TO BYTE 0 AND DO CALL 3
U 10F5, 001D,A000,0180,0800,0010,134D ;3001           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 134D, 0000,013C,0180,0800,0000,10F6 ;3002           Z?                              ; BRANCH IF OK
U 10F6, 0001,A03D,0180,09E8,0000,11F6 ;3003   =0      ERROR2,RC[0D]_Q,BYTE            ;
U 10F7, 0810,0038,0180,0970,0000,134E ;3004           D_RC[0E]                        ; GET EXPECTED DATA
U 134E, 0019,0000,0580,09F0,0000,134F ;3005           RC[0E]_D-K[.1]                  ; SELECT NEXT VALUE OF EXPECTED DATA
U 134F, 0810,0038,0180,0960,0000,1350 ;3006           D_RC[0C]                        ; GET THE LOOP COUNT
U 1350, 0019,8000,0580,09E0,0010,1351 ;3007           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT AND CHECK
U 1351, 0000,013C,0180,0800,0000,10F8 ;3008           Z?                              ; BRANCH IF LOOP DONE
U 10F8, 0000,003C,0180,0800,0000,134C ;3009   =0      J/T114L1                        ; CONTINUE TESTING
                                      ;3010
                                      ;3011   ;////////////////////////////////////////////////////////////////////
                                      ;3012   ;+
                                      ;3013   ; BYTE 2-6 NO SHIFT---CLR.1-5.COND*SAVE FUNCTION
                                      ;3014   ;-
                                      ;3015
U 10F9, 0000,003C,0180,0A08,0000,10FA ;3016   T114S2: LAB_R[1]                        ; INCREMENT ADDRESS OF OP CODES
U 10FA, 0000,003D,0180,0800,0000,130D ;3017   =0      SUBTEST
U 10FB, 0018,0014,0180,0A88,0000,10FC ;3018           R[1]_LA+K[.8]                   ; ...
                                      ;3019
U 10FC, 0000,003D,0180,0800,0000,11F3 ;3020   =0      ERLOOP
U 10FD, 0000,003C,0180,0A00,0200,1352 ;3021           VA_R[0]                         ; LOAD ADDRESS OF EXPECTED DATA
U 1352, 0000,803C,0180,C800,0000,1353 ;3022           D[BYTE]_CACHE.P                 ; READ EXPECTED DATA
```

```
U 1353, 0019,0034,4980,09F0,0000,1354   ;3023           RC[0E]_D.AND.K[.FF]               ; SAVE
U 1354, 0818,0038,1180,0800,0000,1355   ;3024           D_K[.4]                           ; SET THE LOOP COUNT = 6
U 1355, 0019,0014,0980,09E0,0000,10FE   ;3025           RC[0C]_D+K[.2]                    ; ...
U 10FE, 2000,003D,0180,0A08,4200,1313   ;3026   =0      ALU_R[T],FLUSH.IB,CALL,J/IBWAIT   ; LOAD THE OP CODE
U 10FF, F000,003C,0180,0800,0000,1356   ;3027   SYNC21: IBC7CLR.1-5.COND                  ; EXECUTE THE TEST INSTRUCTION
U 1356, C000,003C,0180,0800,0000,1357   ;3028           IBC/CLR.0                         ; SHIFT OVER TO BYTE 2
U 1357, 0810,0038,0180,0970,0000,110A   ;3029   T114L2: D_RC[0E]                          ; PUT ECP ADR IN D REG
                                        ;3030   =0
U 110A, C000,003D,0180,0800,0000,1312   ;3031           IBC/CLR.0,CALL,J/DISPAT           ; DO CALL 3 ON BYTE 2
U 110B, 001D,A000,0180,0800,0010,1358   ;3032           ALU_Q-D,CLK.UBCC,BYTE             ; ADDRESS OK?
U 1358, 0000,013C,0180,0800,0000,1110   ;3033           Z?                                ; BRANCH IF OK
U 1110, 0001,A03D,0180,09E8,0000,11F6   ;3034   =0      ERROR2,RC[0D]_Q,BYTE              ;
U 1111, 0810,0038,0180,0970,0000,1359   ;3035           D_RC[0E]                          ; GET EXPECTED DATA
U 1359, 0019,0000,0580,09F0,0000,135A   ;3036           RC[0E]_D-K[.1]                    ; SELECT NEXT VALUE OF EXPECTED DATA
U 135A, 0810,0038,0180,0960,0000,135B   ;3037           D_RC[0C]                          ; GET THE LOOP COUNT
U 135B, 0019,8000,0580,09E0,0010,135C   ;3038           RC[0C]_D-K[.1],CLK.UBCC,BYTE      ; DECREMENT AND CHECK
U 135C, 0000,013C,0180,0800,0000,1112   ;3039           Z?                                ; BRANCH IF LOOP DONE
U 1112, 0000,003C,0180,0800,0000,1357   ;3040   =0      J/T114L2                          ; CONTINUE TESTING
                                        ;3041
                                        ;3042   ;////////////////////////////////////////////////////////////////////
                                        ;3043   ;+
                                        ;3044   ; BYTE 2-6 ONE SHIFT---CLR.1 FUNCTION
                                        ;3045   ;-
                                        ;3046
U 1113, 0000,003C,0180,0A08,0000,1114   ;3047   T114S3: LAB_R[1]                          ; SELECT NEXT OP CODE
U 1114, 0000,003D,0180,0800,0000,130D   ;3048   =0      SUBTEST
U 1115, 0018,0014,0180,0A88,0000,1116   ;3049           R[1]_LA+K[.8]                     ; ...
                                        ;3050
U 1116, 0000,003D,0180,0800,0000,11F3   ;3051   =0      ERLOOP
U 1117, 0000,003C,0180,0A00,0200,135D   ;3052           VA_R[0]                           ; LOAD ADDRESS OF EXPECTED DATA
U 135D, 0000,803C,0180,C800,0000,135E   ;3053           D[BYTE]_CACHE.P                   ; READ EXPECTED DATA
U 135E, 0019,0034,4980,09F0,0000,135F   ;3054           RC[0E]_D.AND.K[.FF]               ; SAVE
U 135F, 0818,0038,1180,0800,0000,1360   ;3055           D_K[.4]                           ; SET THE LOOP COUNT = 6
U 1360, 0019,0014,0980,09E0,0000,1118   ;3056           RC[0C]_D+K[.2]                    ; ...
U 1118, 2000,003D,0180,0A08,4200,1313   ;3057   =0      ALU_R[T],FLUSH.IB,CALL,J/IBWAIT   ; LOAD THE OP CODE
U 1119, D000,003C,0180,0800,0000,1361   ;3058   SYNC22: IBC7CLR.1                         ; EXECUTE THE TEST INSTRUCTION
U 1361, 0810,0038,0180,0970,0000,111A   ;3059   T114L3: D_RC[0E]                          ; PUT EXPECTED ADR IN D REG
                                        ;3060   =0
U 111A, C000,003D,0180,0800,0000,1312   ;3061           IBC/CLR.0,CALL,J/DISPAT           ; DO CALL 3 ON BYTE 2
U 111B, 001D,A000,0180,0800,0010,1362   ;3062           ALU_Q-D,CLK.UBCC,BYTE             ; ADDRESS OK?
U 1362, 0000,013C,0180,0800,0000,111C   ;3063           Z?                                ; BRANCH IF OK
U 111C, 0001,A03D,0180,09E8,0000,11F6   ;3064   =0      ERROR2,RC[0D]_Q,BYTE              ;
U 111D, 0810,0038,0180,0970,0000,1363   ;3065           D_RC[0E]                          ; GET EXPECTED DATA
U 1363, 0019,0000,0580,09F0,0000,1364   ;3066           RC[0E]_D-K[.1]                    ; SELECT NEXT VALUE OF EXPECTED DATA
U 1364, 0810,0038,0180,0960,0000,1365   ;3067           D_RC[0C]                          ; GET THE LOOP COUNT
U 1365, 0019,8000,0580,09E0,0010,1366   ;3068           RC[0C]_D-K[.1],CLK.UBCC,BYTE      ; DECREMENT AND CHECK
U 1366, 0000,013C,0180,0800,0000,111E   ;3069           Z?                                ; BRANCH IF LOOP DONE
U 111E, 0000,003C,0180,0800,0000,1361   ;3070   =0      J/T114L3                          ; CONTINUE TESTING
                                        ;3071
                                        ;3072   ;////////////////////////////////////////////////////////////////////
                                        ;3073   ;+
                                        ;3074   ; BYTE 2-6 ONE SHIFT---CLR.1-5.COND*-DELTA PC 0 FUNCTION
                                        ;3075   ;-
                                        ;3076
U 111F, 0000,003C,0180,0A08,0000,1120   ;3077   T114S4: LAB_R[1]                          ; SELECT NEXT OP CODE
```

```
U 1120, 0000,003D,0180,0800,0000,130D   ;3078   =0      SUBTEST
U 1121, 0018,0014,0180,0A88,0000,1122   ;3079           R[1]_LA+K[.8]                   ; ...
                                        ;3080
U 1122, 0000,003D,0180,0800,0000,11F3   ;3081   =0      ERLOOP
U 1123, 0000,003C,0180,0A00,0200,1367   ;3082           VA_R[0]                         ; LOAD ADDRESS OF EXPECTED DATA
U 1367, 0000,803C,0180,C800,0000,1368   ;3083           D[BYTE]_CACHE.P                 ; READ EXPECTED DATA
U 1368, 0019,0034,4980,09F0,0000,1369   ;3084           RC[0E]_D.AND.K[.FF]             ; SAVE
U 1369, 0818,0038,1180,0800,0000,136A   ;3085           D_K[.4]                         ; SET THE LOOP COUNT = 5
U 136A, 0019,0014,0580,09E0,0000,1124   ;3086           RC[0C]_D+K[.1]                  ; ...
U 1124, 2000,003D,0180,0A08,4200,1313   ;3087   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 1125, F000,003C,0180,0800,0000,136B   ;3088   SYNC23: IBC/CLR.1-5.COND                ; EXECUTE THE TEST INSTRUCTION
U 136B, C000,003C,0180,0800,0000,136C   ;3089           IBC/CLR.0                       ; SHIFT BYTE 1
U 136C, 0810,0038,0180,0970,0000,1126   ;3090   T114L4: D_RC[0E]                        ; PUT EXPEC ADR IN D REG
                                        ;3091   =0
U 1126, C000,003D,0180,0800,0000,1312   ;3092           IBC/CLR.0,CALL,J/DISPAT         ; DO CALL 3 ON BYTE 2
U 1127, 001D,A000,0180,0800,0010,136D   ;3093           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 136D, 0000,013C,0180,0800,0000,1128   ;3094           Z?                              ; BRANCH IF OK
U 1128, 0001,A03D,0180,09E8,0000,11F6   ;3095   =0      ERROR2,RC[0D]_Q,BYTE            ;
U 1129, 0810,0038,0180,0970,0000,136E   ;3096           D_RC[0E]                        ; GET EXPECTED DATA
U 136E, 0019,0000,0580,09F0,0000,136F   ;3097           RC[0E]_D-K[.1]                  ; SELECT NEXT VALUE OF EXPECTED DATA
U 136F, 0810,0038,0180,0960,0000,1370   ;3098           D_RC[0C]                        ; GET THE LOOP COUNT
U 1370, 0019,8000,0580,09E0,0010,1371   ;3099           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT AND CHECK
U 1371, 0000,013C,0180,0800,0000,112A   ;3100           Z?                              ; BRANCH IF LOOP DONE
U 112A, 0000,003C,0180,0800,0000,136C   ;3101   =0      J/T114L4                        ; CONTINUE TESTING
                                        ;3102
                                        ;3103   ;////////////////////////////////////////////////////////////////////////
                                        ;3104   ;+
                                        ;3105   ; BYTE 2-6 ONE SHIFT---CLR.1-5.COND*DELTA PC 0*-DELTA PC 1*-DELTA PC 2*-PC 1 EN A*-P
                                        ;3106   ;-
                                        ;3107
U 112B, 0000,003C,0180,0A08,0000,112C   ;3108   T114S5: LAB_R[1]                        ; SELECT NEXT OP CODE
U 112C, 0000,003D,0180,0800,0000,130D   ;3109   =0      SUBTEST
U 112D, 0018,0014,0180,0A88,0000,112E   ;3110           R[1]_LA+K[.8]                   ; ...
                                        ;3111
U 112E, 0000,003D,0180,0800,0000,11F3   ;3112   =0      ERLOOP
U 112F, 0000,003C,0180,0A00,0200,1372   ;3113           VA_R[0]                         ; LOAD ADDRESS OF EXPECTED DATA
U 1372, 0000,803C,0180,C800,0000,1373   ;3114           D[BYTE]_CACHE.P                 ; READ EXPECTED DATA
U 1373, 0019,0034,4980,09F0,0000,1374   ;3115           RC[0E]_D.AND.K[.FF]             ; SAVE
U 1374, 0818,0038,1180,0800,0000,1375   ;3116           D_K[.4]                         ; SET THE LOOP COUNT = 6
U 1375, 0019,0014,0980,09E0,0000,1130   ;3117           RC[0C]_D+K[.2]                  ; ...
U 1130, 2000,003D,0180,0A08,4200,1313   ;3118   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 1131, F000,003C,0180,0800,0000,1376   ;3119   SYNC24: IBC/CLR.1-5.COND                ; EXECUTE THE TEST INSTRUCTION
U 1376, 0810,0038,0180,0970,0000,1132   ;3120   T114L5: D_RC[0E]                        ; PUT EXPEC ADR IN D REG
                                        ;3121   =0
U 1132, C000,003D,0180,0800,0000,1312   ;3122           IBC/CLR.0,CALL,J/DISPAT         ; DO CALL 3 ON BYTE 2
U 1133, 001D,A000,0180,0800,0010,1377   ;3123           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 1377, 0000,013C,0180,0800,0000,1134   ;3124           Z?                              ; BRANCH IF OK
U 1134, 0001,A03D,0180,09E8,0000,11F6   ;3125   =0      ERROR2,RC[0D]_Q,BYTE            ;
U 1135, 0810,0038,0180,0970,0000,1378   ;3126           D_RC[0E]                        ; GET EXPECTED DATA
U 1378, 0019,0000,0580,09F0,0000,1379   ;3127           RC[0E]_D-K[.1]                  ; SELECT NEXT VALUE OF EXPECTED DATA
U 1379, 0810,0038,0180,0960,0000,137A   ;3128           D_RC[0C]                        ; GET THE LOOP COUNT
U 137A, 0019,8000,0580,09E0,0010,137B   ;3129           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT AND CHECK
U 137B, 0000,013C,0180,0800,0000,1136   ;3130           Z?                              ; BRANCH IF LOOP DONE
U 1136, 0000,003C,0180,0800,0000,1376   ;3131   =0      J/T114L5                        ; CONTINUE TESTING
U 1137, 0000,003C,0180,0800,0000,1138   ;3132           NOP
```

```
                                             ;3133
                                             ;3134
                                             ;3135   ;/////////////////////////////////////////////////////////////////
                                             ;3136   ;+
                                             ;3137   ; BYTE 2-6 TWO SHIFT---CLR.0.1 FUNCTION
                                             ;3138   ;-
                                             ;3139
U 1138, 0000,003D,0180,0800,0000,130D        ;3140   =0      SUBTEST
U 1139, 0000,003C,0180,0800,0000,113A        ;3141           NOP
                                             ;3142   =0
U 113A, 0000,003D,0180,0800,0000,11F3        ;3143   T114S6: ERLOOP
U 113B, 0000,003C,0180,0A00,0200,137C        ;3144           VA_R[0]                         ; LOAD ADDRESS OF EXPECTED DATA
U 137C, 0000,803C,0180,C800,0000,137D        ;3145           D[BYTE]_CACHE.P                 ; READ EXPECTED DATA
U 137D, 0019,0034,4980,09F0,0000,137E        ;3146           RC[0E]_D.AND.K[.FF]             ; SAVE
U 137E, 0818,0038,1180,0800,0000,137F        ;3147           D_K[.4]                         ; SET THE LOOP COUNT = 6
U 137F, 0019,0014,0980,09E0,0000,113C        ;3148           RC[0C]_D+K[.2]                  ; ...
U 113C, 2000,003D,0180,0A08,4200,1313        ;3149   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 113D, 4000,003C,0180,0800,0000,1380        ;3150   SYNC25: IBC7CLR.0.1                     ; EXECUTE THE TEST INSTRUCTION
U 1380, 0810,0038,0180,0970,0000,113E        ;3151   T114L6: D_RC[0E]                        ; PUT EXP ADR IN D REG
                                             ;3152   =0
U 113E, 0000,003D,0180,0800,0000,1312        ;3153           CALL,J/DISPAT                   ; DO CALL 3 ON BYTE 2
U 113F, 001D,A000,0180,0800,0010,1381        ;3154           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 1381, 0000,013C,0180,0800,0000,1140        ;3155           Z?                              ; BRANCH IF OK
U 1140, 0001,A03D,0180,09E8,0000,11F6        ;3156   =0      ERROR2,RC[0D]_Q,BYTE            ;
U 1141, C000,003C,0180,0800,0000,1382        ;3157           IBC/CLR.0
U 1382, 0810,0038,0180,0970,0000,1383        ;3158           D_RC[0E]                        ; GET EXPECTED DATA
U 1383, 0019,0000,0580,09F0,0000,1384        ;3159           RC[0E]_D-K[.1]                  ; SELECT NEXT VALUE OF EXPECTED DATA
U 1384, 0810,0038,0180,0960,0000,1385        ;3160           D_RC[0C]                        ; GET THE LOOP COUNT
U 1385, 0019,8000,0580,09E0,0010,1386        ;3161           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT AND CHECK
U 1386, 0000,013C,0180,0800,0000,1142        ;3162           Z?                              ; BRANCH IF LOOP DONE
U 1142, 0000,003C,0180,0800,0000,1380        ;3163   =0      J/T114L6                        ; CONTINUE TESTING
                                             ;3164
                                             ;3165   ;/////////////////////////////////////////////////////////////////
                                             ;3166   ;+
                                             ;3167   ; BYTE 2-6 TWO SHIFT---CLR.2.3 FUNCTION
                                             ;3168   ;-
                                             ;3169
U 1143, 0000,003C,0180,0A08,0000,1144        ;3170   T114S7: LAB_R[1]                        ; SELECT NEXT OP CODE
U 1144, 0000,003D,0180,0800,0000,130D        ;3171   =0      SUBTEST
U 1145, 0018,0014,0180,0A88,0000,1146        ;3172           R[1]_LA+K[.8]                   ; ...
                                             ;3173
U 1146, 0000,003D,0180,0800,0000,11F3        ;3174   =0      ERLOOP
U 1147, 0000,003C,0180,0A00,0200,1387        ;3175           VA_R[0]                         ; LOAD ADDRESS OF EXPECTED DATA
U 1387, 0000,803C,0180,C800,0000,1388        ;3176           D[BYTE]_CACHE.P                 ; READ EXPECTED DATA
U 1388, 0019,0034,4980,09F0,0000,1389        ;3177           RC[0E]_D.AND.K[.FF]             ; SAVE
U 1389, 0018,0038,1180,09E0,0000,1148        ;3178           RC[0C]_K[.4]                    ; SET THE LOOP COUNT = 4
U 1148, 2000,003D,0180,0A08,4200,1313        ;3179   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 1149, 5000,003C,0180,0800,0000,138A        ;3180   SYNC26: IBC7CLR.2.3                     ; EXECUTE THE TEST INSTRUCTION
U 138A, C000,003C,0180,0800,0000,138B        ;3181           IBC/CLR.0
U 138B, 0810,0038,0180,0970,0000,114A        ;3182   T114L7: D_RC[0E]                        ; PUT EXP ADR IN D REG
                                             ;3183   =0
U 114A, C000,003D,0180,0800,0000,1312        ;3184           IBC/CLR.0,CALL,J/DISPAT         ; DO CALL 3 ON BYTE 2
U 114B, 001D,A000,0180,0800,0010,138C        ;3185           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 138C, 0000,013C,0180,0800,0000,114C        ;3186           Z?                              ; BRANCH IF OK
U 114C, 0001,A03D,0180,09E8,0000,11F6        ;3187   =0      ERROR2,RC[0D]_Q,BYTE            ;
```

```
U 114D, 0810,0038,0180,0970,0000,138D   ;3188           D_RC[0E]                        ; GET EXPECTED DATA
U 138D, 0019,0000,0580,09F0,0000,138E   ;3189           RC[0E]_D-K[.1]                  ; SELECT NEXT VALUE OF EXPECTED DATA
U 138E, 0810,0038,0180,0960,0000,138F   ;3190           D_RC[0C]                        ; GET THE LOOP COUNT
U 138F, 0019,8000,0580,09E0,0010,1390   ;3191           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT AND CHECK
U 1390, 0000,013C,0180,0800,0000,114E   ;3192           Z?                              ; BRANCH IF LOOP DONE
U 114E, 0000,003C,0180,0800,0000,138B   ;3193   =0      J/T114L7                        ; CONTINUE TESTING
                                        ;3194
                                        ;3195   ;///////////////////////////////////////////////////////////////////
                                        ;3196   ;+
                                        ;3197   ; BYTE 2-6 TWO SHIFT---CLR.1-5.COND*DELTA PC 0*DELTA PC 1*DELTA PC 2 FUNCTION
                                        ;3198   ;-
                                        ;3199
U 114F, 0000,003C,0180,0A08,0000,1150   ;3200   T114S8: LAB_R[1]                        ; SELECT NEXT OP CODE
U 1150, 0000,003D,0180,0800,0000,130D   ;3201   =0      SUBTEST
U 1151, 0018,0014,0180,0A88,0000,1152   ;3202           R[1]_LA+K[.8]                   ; ...
                                        ;3203
U 1152, 0000,003D,0180,0800,0000,11F3   ;3204   =0      ERLOOP
U 1153, 0000,003C,0180,0A00,0200,1391   ;3205           VA_R[0]                         ; LOAD ADDRESS OF EXPECTED DATA
U 1391, 0000,803C,0180,C800,0000,1392   ;3206           D[BYTE]_CACHE.P                 ; READ EXPECTED DATA
U 1392, 0019,0034,4980,09F0,0000,1393   ;3207           RC[0E]_D.AND.K[.FF]             ; SAVE
U 1393, 0018,0038,1180,09E0,0000,1156   ;3208           RC[0C]_K[.4]                    ; SET THE LOOP COUNT = 4
U 1156, 2000,003D,0180,0A08,4200,1313   ;3209   =0      ALU_R[T],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 1157, F000,003C,0180,0800,0000,1394   ;3210   SYNC27: IBC7CLR.1-5.COND                ; EXECUTE THE TEST INSTRUCTION
U 1394, C000,003C,0180,0800,0000,1395   ;3211           IBC/CLR.0
U 1395, 0810,0038,0180,0970,0000,1158   ;3212   T114L8: D_RC[0E]                        ; PUT EXP ADR IN D REG
                                        ;3213   =0
U 1158, C000,003D,0180,0800,0000,1312   ;3214           IBC/CLR.0,CALL,J/DISPAT         ; DO CALL 3 ON BYTE 2
U 1159, 001D,A000,0180,0800,0010,1396   ;3215           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 1396, 0000,013C,0180,0800,0000,115A   ;3216           Z?                              ; BRANCH IF OK
U 115A, 0001,A03D,0180,09E8,0000,11F6   ;3217   =0      ERROR2,RC[0D]_Q,BYTE            ;
U 115B, 0810,0038,0180,0970,0000,1397   ;3218           D_RC[0E]                        ; GET EXPECTED DATA
U 1397, 0019,0000,0580,09F0,0000,1398   ;3219           RC[0E]_D-K[.1]                  ; SELECT NEXT VALUE OF EXPECTED DATA
U 1398, 0810,0038,0180,0960,0000,1399   ;3220           D_RC[0C]                        ; GET THE LOOP COUNT
U 1399, 0019,8000,0580,09E0,0010,139A   ;3221           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT AND CHECK
U 139A, 0000,013C,0180,0800,0000,115C   ;3222           Z?                              ; BRANCH IF LOOP DONE
U 115C, 0000,003C,0180,0800,0000,1395   ;3223   =0      J/T114L8                        ; CONTINUE TESTING
                                        ;3224
                                        ;3225   ;///////////////////////////////////////////////////////////////////
                                        ;3226   ;+
                                        ;3227   ; BYTE 2-6 TWO SHIFT---CLR.1-5.COND*DELTA PC 0*DELTA PC 1*-DELTA PC 2*PC 1 EN A*-PC
                                        ;3228   ;-
                                        ;3229
U 115D, 0000,003C,0180,0A08,0000,115E   ;3230   T114S9: LAB_R[1]                        ; SELECT NEXT OP CODE
U 115E, 0000,003D,0180,0800,0000,130D   ;3231   =0      SUBTEST
U 115F, 0018,0014,0180,0A88,0000,1160   ;3232           R[1]_LA+K[.8]                   ; ...
                                        ;3233
U 1160, 0000,003D,0180,0800,0000,11F3   ;3234   =0      ERLOOP
U 1161, 0000,003C,0180,0A00,0200,139B   ;3235           VA_R[0]                         ; LOAD ADDRESS OF EXPECTED DATA
U 139B, 0000,803C,0180,C800,0000,139C   ;3236           D[BYTE]_CACHE.P                 ; READ EXPECTED DATA
U 139C, 0019,0034,4980,09F0,0000,139D   ;3237           RC[0E]_D.AND.K[.FF]             ; SAVE
U 139D, 0018,0038,1180,09E0,0000,1162   ;3238           RC[0C]_K[.4]                    ; SET THE LOOP COUNT = 4
U 1162, 2000,003D,0180,0A08,4200,1313   ;3239   =0      ALU_R[T],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE OP CODE
U 1163, F000,003C,0180,0800,0000,139E   ;3240   SYNC28: IBC7CLR.1-5.COND                ; EXECUTE THE TEST INSTRUCTION
U 139E, C000,003C,0180,0800,0000,139F   ;3241           IBC/CLR.0
U 139F, 0810,0038,0180,0970,0000,1164   ;3242   T114L9: D_RC[0E]                        ; PUT EXP ADR IN D REG
```

```
                                            ;3243   =0
U 1164, C000,003D,0180,0800,0000,1312       ;3244           IBC/CLR.0,CALL,J/DISPAT           ; DO CALL 3 ON BYTE 2
U 1165, 001D,A000,0180,0800,0010,13A0       ;3245           ALU_Q-D,CLK.UBCC,BYTE             ; ADDRESS OK?
U 13A0, 0000,013C,0180,0800,0000,1166       ;3246           Z?                                ; BRANCH IF OK
U 1166, 0001,A03D,0180,09E8,0000,11F6       ;3247   =0      ERROR2,RC[0D]_Q,BYTE              ;
U 1167, 0810,0038,0180,0970,0000,13A1       ;3248           D_RC[0E]                          ; GET EXPECTED DATA
U 13A1, 0019,0000,0580,09F0,0000,13A2       ;3249           RC[0E]_D-K[.1]                    ; SELECT NEXT VALUE OF EXPECTED DATA
U 13A2, 0810,0038,0180,0960,0000,13A3       ;3250           D_RC[0C]                          ; GET THE LOOP COUNT
U 13A3, 0019,8000,0580,09E0,0010,13A4       ;3251           RC[0C]_D-K[.1],CLK.UBCC,BYTE      ; DECREMENT AND CHECK
U 13A4, 0000,013C,0180,0800,0000,1168       ;3252           Z?                                ; BRANCH IF LOOP DONE
U 1168, 0000,003C,0180,0800,0000,139F       ;3253   =0      J/T114L9                          ; CONTINUE TESTING
                                            ;3254
                                            ;3255   ;///////////////////////////////////////////////////////////////////////
                                            ;3256   ;+
                                            ;3257   ; BYTE 2-6 TWO SHIFT---CLR.1-5.COND*DELTA PC 0*DELTA PC 1*-DELTA PC 2*-PC 1 EN A*PC
                                            ;3258   ;-
                                            ;3259
U 1169, 0000,003C,0180,0A08,0000,116A       ;3260   T114SA: LAB_R[1]                          ; SELECT NEXT OP CODE
U 116A, 0000,003D,0180,0800,0000,130D       ;3261   =0      SUBTEST
U 116B, 0018,0014,0180,0A88,0000,116C       ;3262           R[1]_LA+K[.8]                     ; ...
                                            ;3263
U 116C, 0000,003D,0180,0800,0000,11F3       ;3264   =0      ERLOOP
U 116D, 0000,003C,0180,0A00,0200,13A5       ;3265           VA_R[0]                           ; LOAD ADDRESS OF EXPECTED DATA
U 13A5, 0000,803C,0180,C800,0000,13A6       ;3266           D[BYTE]_CACHE.P                   ; READ EXPECTED DATA
U 13A6, 0019,0034,4980,09F0,0000,13A7       ;3267           RC[0E]_D.AND.K[.FF]               ; SAVE
U 13A7, 0018,0038,1180,09E0,0000,116E       ;3268           RC[0C]_K[.4]                      ; SET THE LOOP COUNT = 4
U 116E, 2000,003D,0180,0A08,4200,1313       ;3269   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT   ; LOAD THE OP CODE
U 116F, F000,003C,0180,0800,0000,13A8       ;3270   SYNC29: IBC/CLR.1-5.COND                  ; EXECUTE THE TEST INSTRUCTION
U 13A8, C000,003C,0180,0800,0000,13A9       ;3271           IBC/CLR.0
U 13A9, 0810,0038,0180,0970,0000,1170       ;3272   T114LA: D_RC[0E]                          ; PUT EXP ADR IN D REG
                                            ;3273   =0
U 1170, C000,003D,0180,0800,0000,1312       ;3274           IBC/CLR.0,CALL,J/DISPAT           ; DO CALL 3 ON BYTE 2
U 1171, 001D,A000,0180,0800,0010,13AA       ;3275           ALU_Q-D,CLK.UBCC,BYTE             ; ADDRESS OK?
U 13AA, 0000,013C,0180,0800,0000,1172       ;3276           Z?                                ; BRANCH IF OK
U 1172, 0001,A03D,0180,09E8,0000,11F6       ;3277   =0      ERROR2,RC[0D]_Q,BYTE              ;
U 1173, 0810,0038,0180,0970,0000,13AB       ;3278           D_RC[0E]                          ; GET EXPECTED DATA
U 13AB, 0019,0000,0580,09F0,0000,13AC       ;3279           RC[0E]_D-K[.1]                    ; SELECT NEXT VALUE OF EXPECTED DATA
U 13AC, 0810,0038,0180,0960,0000,13AD       ;3280           D_RC[0C]                          ; GET THE LOOP COUNT
U 13AD, 0019,8000,0580,09E0,0010,13AE       ;3281           RC[0C]_D-K[.1],CLK.UBCC,BYTE      ; DECREMENT AND CHECK
U 13AE, 0000,013C,0180,0800,0000,1174       ;3282           Z?                                ; BRANCH IF LOOP DONE
U 1174, 0000,003C,0180,0800,0000,13A9       ;3283   =0      J/T114LA                          ; CONTINUE TESTING
                                            ;3284
                                            ;3285
                                            ;3286   ;///////////////////////////////////////////////////////////////////////
                                            ;3287   ;+
                                            ;3288   ; BYTE 2-6 FOUR SHIFT---CLR.0-3 FUNCTION
                                            ;3289   ;-
                                            ;3290
U 1175, 0000,003C,0180,0A08,0000,1176       ;3291   T114SB: LAB_R[1]                          ; SELECT NEXT OP CODE
U 1176, 0000,003D,0180,0800,0000,130D       ;3292   =0      SUBTEST
U 1177, 0018,0014,0180,0A88,0000,1178       ;3293           R[1]_LA+K[.8]                     ; ...
                                            ;3294
U 1178, 0000,003D,0180,0800,0000,11F3       ;3295   =0      ERLOOP
U 1179, 0000,003C,0180,0A00,0200,13AF       ;3296           VA_R[0]                           ; LOAD ADDRESS OF EXPECTED DATA
U 13AF, 0000,803C,0180,C800,0000,13B0       ;3297           D[BYTE]_CACHE.P                   ; READ EXPECTED DATA
```

```
U 13B0, 0019,0034,4980,09F0,0000,13B1                    RC[OE]_D.AND.K[.FF]              ; SAVE
U 13B1, 0018,0038,0980,09E0,0000,117A                    RC[OC]_K[.2]                     ; SET THE LOOP COUNT = 2
U 117A, 2C00,003D,0180,0A08,4200,1313           =0       ALU_R[T],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE OP CODE
U 117B, E000,003C,0180,0800,0000,13B2           SYNC30:  IBC/CLR.0-3                      ; EXECUTE THE TEST INSTRUCTION
U 13B2, C000,003C,0180,0800,0000,13B3                    IBC/CLR.0
U 13B3, 0810,0038,0180,0970,0000,117C           T114LB:  D_RC[OE]                         ; PUT EXP ADR IN D REG
                                                =0
U 117C, C000,003D,0180,0800,0000,1312                    IBC/CLR.0,CALL,J/DISPAT          ; DO CALL 3 ON BYTE 2
U 117D, 001D,A000,0180,0800,0010,13B4                    ALU_Q-D,CLK.UBCC,BYTE            ; ADDRESS OK?
U 13B4, 0000,013C,0180,0800,0000,117E                    Z?                               ; BRANCH IF OK
U 117E, 0001,A03D,0180,09E8,0000,11F6           =0       ERROR2,RC[OD]_Q,BYTE             ;
U 117F, 0810,0038,0180,0970,0000,13B5                    D_RC[OE]                         ; GET EXPECTED DATA
U 13B5, 0019,0000,0580,09F0,0000,13B6                    RC[OE]_D-K[.1]                   ; SELECT NEXT VALUE OF EXPECTED DATA
U 13B6, 0810,0038,0180,0960,0000,13B7                    D_RC[OC]                         ; GET THE LOOP COUNT
U 13B7, 0019,8000,0580,09E0,0010,13B8                    RC[OC]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT AND CHECK
U 13B8, 0000,013C,0180,0800,0000,1180                    Z?                               ; BRANCH IF LOOP DONE
U 1180, 0000,003C,0180,0800,0000,13B3           =0       J/T114LB                         ; CONTINUE TESTING


                                                ;//////////////////////////////////////////////////////////////////////
                                                ;+
                                                ; BYTE 2-6 FOUR SHIFT---CLR.1-5.COND*DELTA PC 0*-DELTA PC 1*DELTA PC 2*-PC 1 EN A*-P
                                                ;-

U 1181, 0000,003C,0180,0A08,0000,1182           T114SC:  LAB_R[1]                         ; SELECT NEXT OP CODE
U 1182, 0000,003D,0180,0800,0000,130D           =0       SUBTEST
U 1183, 0018,0014,0180,0A88,0000,1184                    R[1]_LA+K[.8]                    ; ...

U 1184, 0000,003D,0180,0800,0000,11F3           =0       ERLOOP
U 1185, 0000,003C,0180,0A00,0200,13B9                    VA_R[0]                          ; LOAD ADDRESS OF EXPECTED DATA
U 13B9, 0000,803C,0180,C800,0000,13BA                    D[BYTE]_CACHE.P                  ; READ EXPECTED DATA
U 13BA, 0019,0034,4980,09F0,0000,13BB                    RC[OE]_D.AND.K[.FF]              ; SAVE
U 13BB, 0018,0038,0980,09E0,0000,1186                    RC[OC]_K[.2]                     ; SET THE LOOP COUNT = 2
U 1186, 2000,003D,0180,0A08,4200,1313           =0       ALU_R[T],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE OP CODE
U 1187, F000,003C,0180,0800,0000,13BC           SYNC31:  IBC/CLR.1-5.COND                 ; EXECUTE THE TEST INSTRUCTION
U 13BC, C000,003C,0180,0800,0000,13BD                    IBC/CLR.0
U 13BD, 0810,0038,0180,0970,0000,1188           T114LC:  D_RC[OE]                         ; PUT EXP ADR IN D REG
                                                =0
U 1188, C000,003D,0180,0800,0000,1312                    IBC/CLR.0,CALL,J/DISPAT          ; DO CALL 3 ON BYTE 2
U 1189, 001D,A000,0180,0800,0010,13BE                    ALU_Q-D,CLK.UBCC,BYTE            ; ADDRESS OK?
U 13BE, 0000,013C,0180,0800,0000,118A                    Z?                               ; BRANCH IF OK
U 118A, 0001,A03D,0180,09E8,0000,11F6           =0       ERROR2,RC[OD]_Q,BYTE             ;
U 118B, 0810,0038,0180,0970,0000,13BF                    D_RC[OE]                         ; GET EXPECTED DATA
U 13BF, 0019,0000,0580,09F0,0000,13C0                    RC[OE]_D-K[.1]                   ; SELECT NEXT VALUE OF EXPECTED DATA
U 13C0, 0810,0038,0180,0960,0000,13C1                    D_RC[OC]                         ; GET THE LOOP COUNT
U 13C1, 0019,8000,0580,09E0,0010,13C2                    RC[OC]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT AND CHECK
U 13C2, 0000,013C,0180,0800,0000,118C                    Z?                               ; BRANCH IF LOOP DONE
U 118C, 0000,003C,0180,0800,0000,13BD           =0       J/T114LC                         ; CONTINUE TESTING
U 118D, 0000,003C,0180,0800,0000,118E                    NOP
                                                ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                                ;% 80
                                                ;$ 008F
                                                ;
                                                ; THE FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:
                                                ;% 84
```

```
;3353   ; SUBTST 1
;3354   ;$ 0000,0100,0302,0504
;3355   ; SUBTST 2
;3356   ;$ 5094,0100,0302,0504
;3357   ; SUBTST 3
;3358   ;$ 40D0,0100,0302,0504
;3359   ; SUBTST 4
;3360   ;$ A090,00FF,0201,0403
;3361   ; SUBTST 5 AND 6
;3362   ;$ 9090,0100,0302,0504
;3363   ; SUBTST 7
;3364   ;$ FFFF,FFFF,0100,0302
;3365   ; SUBTST 8
;3366   ;$ C0B0,FFFF,0100,0302
;3367   ; SUBTST 9
;3368   ;$ C0D0,FFFF,0100,0302
;3369   ; SUBTST A
;3370   ;$ 8FB0,FFFF,0100,0302
;3371   ; SUBTST B
;3372   ;$ FFFF,FFFF,FFFF,0100
;3373   ; SUBTST C
;3374   ;$ E0D0,FFFF,FFFF,0100
;3375
```

```
                                        ;3376   .PAGE   "TEST 115       BYTE ROTATOR DATA INTEGRITY"
                                        ;3377   ;**********************************************************************
                                        ;3378   ;++
                                        ;3379   ; TEST  115     BYTE ROTATOR DATA INTEGRITY
                                        ;3380   ;
                                        ;3381   ; TEST DESCRIPTION
                                        ;3382   ;       THIS TEST CHECKS THE SELECT LINES AND THE DATA PATH LINES OF
                                        ;3383   ;       THE BYTE ROTATOR. THIS IS DONE BY SETTING THE LOWER TWO BITS
                                        ;3384   ;       OF THE INSTRUCTION BUFFER ADDRESS (IBA) TO VALUES OF 00,01,
                                        ;3385   ;       10, AND 11, ALLOWING THE IB TO FILL WITH A DATA PATTERN, THEN
                                        ;3386   ;       EXECUTING A SUB/SPEC FUNCTION FOR EACH OF THE FIRST FOUR BYTES.
                                        ;3387   ;
                                        ;3388   ;       THE DATA PATTERNS ARE ALTERNATING BYTES OF ZEROS AND ONES, SO THAT
                                        ;3389   ;       THE DISPATCH ADDRESS SHOULD EITHER BE 8F OR 83.
                                        ;3390   ;
                                        ;3391   ;       SUBTST 1 - CHECKS VALUES OF IBA<1:0> OF 00,01, AND 11 WITH DATA
                                        ;3392   ;                  PATTERNS OF FF00FF00, 00FF00FF, AND 00FF00FF RESPECTIVELY,
                                        ;3393   ;                  WHICH SHOULD ALL BE ROTATED INTO A PATTERN OF FF00FF00.
                                        ;3394   ;
                                        ;3395   ;       SUBTST 2 - SAME AS SUB TEST 1 EXCEPT WITH THE COMPLIMENT DATA PATTERN.
                                        ;3396   ;
                                        ;3397   ;       SUBTST 3 - CHECKS THE IBA BITS<1:0> VALUE OF 10 WITH AN INPUT
                                        ;3398   ;                  DATA PATTERN OF 0000FFFF, WHICH SHOULD BE ROTATED INTO
                                        ;3399   ;                  A PATTERN OF FFFF0000.
                                        ;3400   ;
                                        ;3401   ;       SUBTST 4 - SAME AS SUB TEST 3 EXCEPT WITH THE COMPLIMENT DATA PATTERN.
                                        ;3402   ;
                                        ;3403   ; LOGIC DESCRIPTION
                                        ;3404   ;       THIS TEST CHECKS THE 25S10 CHIPS THAT MAKE UP THE BYTE ROTATOR ON
                                        ;3405   ;       THE IDP MODULE.
                                        ;3406   ;
                                        ;3407   ; ERROR DESCRIPTION
                                        ;3408   ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                        ;3409   ;             RECEIVED MICRO PC BITS <7:0>
                                        ;3410   ;             LOOP COUNT THAT TELLS WHICH BYTE WAS BEING TESTED.
                                        ;3411   ;               4=BYTE 0, 3=BYTE 1, 2=BYTE 2, 1=BYTE 3
                                        ;3412   ;             LOOP COUNT THAT TELLS WHAT THE IBA BITS<1:0> ARE.
                                        ;3413   ;               3=00, 2=01, 1=11 FOR SUBTESTS 1 & 2, NOT USED IN 3 & 4.
                                        ;3414   ;
                                        ;3415   ; SYNC POINT DESCRIPTION
                                        ;3416   ;       ADDRESS SYNC02 - CACHE DATA IS LOADED INTO THE BUFFER
                                        ;3417   ;       ADDRESS SYNC00 - IB ADDRESS IS ENABLED ONTO THE UPC LINES
                                        ;3418   ;                        AT THE INSTRUCTION AFTER THIS INSTRUCTION.
                                        ;3419   ;       SUBTST 1 - SYNC32--BYTE 0 OF THE BUFFER IS CLEARED
                                        ;3420   ;       SUBTST 2 - SYNC33--BYTE 0 OF THE BUFFER IS CLEARED
                                        ;3421   ;       SUBTST 3 - SYNC34--BYTE 0 OF THE BUFFER IS CLEARED
                                        ;3422   ;       SUBTST 4 - SYNC35--BYTE 0 OF THE BUFFER IS CLEARED
                                        ;3423   ;--
                                        ;3424   ;**********************************************************************
                                        ;3425   =0
U 118E, 0018,0039,1180,09F8,0000,11DF   ;3426   T115:   NEWTST[.4]
U 118F, 0000,003C,0180,0800,0000,1190   ;3427           NOP
U 1190, 0818,0039,6180,0800,0000,1300   ;3428   =0      D_K[.F],CALL,J/DC8              ; GEN ADR FOR IB DATA
U 1191, 0001,003C,0180,0A88,0000,1192   ;3429           R[1]_D
U 1192, 0818,0039,01C0,0800,0000,11FB   ;3430   =0      D_K[.8],Q_K[.8],CALL,J/DC3      ; GEN EXP ADR WHEN BYTE 0=FF
```

```
U 1193, 0C01,003C,0180,0A90,0000,1194                  R[2]_D,D_Q                         ; ...
U 1194, 0000,003D,0180,0800,0000,1307           =0     CALL,J/DCF                         ; GEN EXP ADR WHEN BYTE 0=00
U 1195, 0001,003C,0180,0A98,0000,1196                  R[3]_D                             ; ...

                                                ;//////////////////////////////////////////////////////////////////////
                                                ;+
                                                ; THIS SUBTEST TEST CHECKS IBA<1:0> VALUES OF 00,01, AND 11 WITH A
                                                ; DATA PATTERN OF ---FF00FF00---
                                                ;-

                                                =0
U 1196, 0000,003D,0180,0800,0000,130D           T115S1: SUBTEST
U 1197, 0018,0038,0D80,09D8,0000,1198                  RC[0B]_K[.3]                       ; INIT THE IBA COUNTER
U 1198, 0000,003D,0180,0800,0000,11F3           =0     ERLOOP
U 1199, 0018,0038,1180,09E0,0000,119A           T115L3: RC[0C]_K[.4]                      ; INIT THE BYTE COUNTER
U 119A, 2000,003D,0180,0A08,4200,1313           =0     ALU_R[1],FLUSH.IB,CALL,J/IBWAIT    ; LOAD THE IB
U 119B, 0000,003C,0180,0A18,0000,13C3           T115L1: LAB_R[3]                          ; GET BYTE 0=00 ADDRESS
U 13C3, 0800,003C,0180,09F0,0000,119C           T115L2: RC[0E]_LA,D_LA                    ; SAVE IN RC[E] AND PUT IN D REG
U 119C, 0000,003D,0180,0800,0000,1312           =0     CALL,J7DISPAT                      ; CHECK A BYTE
U 119D, 001D,A000,0180,0800,0010,13C4                  ALU_Q-D,CLK.UBCC,BYTE              ; ADR OK?
U 13C4, 0000,013C,0180,0800,0000,119E                  Z?                                 ; BRANCH IF YES
U 119E, 0001,A03D,0180,09E8,0000,11F4           =0     ERROR1,RC[0D]_Q,BYTE               ;

                                                ;+
                                                ; THE FOLLOWING CODE IS LOOP CONTROL FOR SUB TEST 1
                                                ;-

U 119F, C810,0038,0180,0960,0000,13C5           SYNC32: D_RC[0C],IBC/CLR.0                ; GET THE BYTE COUNTER
U 13C5, 0819,8000,0580,09E0,0010,13C6                  RC[0C]_D-K[.1],D_ALU,CLK.UBCC,BYTE ; INCREMENT COUNT AND CHECK
U 13C6, 0000,013C,0180,0800,0000,11A0                  Z?                                 ; BRANCH IF BYTE COUNT DONE
U 11A0, 0000,003C,0180,0800,0000,13C7           =0     J/T115P1                           ; GO COMPLIMENT EXP ADR AND CONT
U 11A1, 0800,003C,0180,0A08,0000,13C8                  J/T115P2,D_R[1]                    ; GO INCREMENT IBA AND CONT
U 13C7, 0000,193C,0180,0800,0000,100E           T115P1: D0?                               ; BRANCH IF TIME TO USE FF ADR
U 100E, 0000,003C,0180,0800,0000,119B           =1110  J/T115L1                           ; USE 00 ADDRESS
U 100F, 0000,003C,0180,0A10,0000,13C3                  LAB_R[2],J/T115L2                  ; USE FF ADR

U 13C8, 0819,0014,0180,0800,0000,13C9           T115P2: D_D+K[.8]                         ; INCREMENT IB DATA ADR TO NEXT PATTERN
U 13C9, 0019,0014,0580,0A88,0000,13CA                  R[1]_D+K[.1]                       ; SELECT NEXT VALUE OF IBA<1:0>
U 13CA, 0810,0038,0180,0958,0000,13CB                  D_RC[0B]                           ; GET THE IBA COUNTER
U 13CB, 0819,8000,0580,09D8,0010,13CC                  RC[0B]_D-K[.1],D_ALU,CLK.UBCC,BYTE ; INCREMENT IBA COUNTER
U 13CC, 0000,013C,0180,0800,0000,11A2                  Z?                                 ; BRANCH IF DONE
U 11A2, 0000,003C,0180,0800,0000,13CD           =0     J/T115P3                           ; GO CHECK IF TIME FOR IBA<1:0>=11
U 11A3, 0000,003C,0180,0800,0000,11A4                  J/T115S2                           ; GO TO NEXT SUBTEST

U 13CD, 0000,193C,0180,0A08,0000,101E           T115P3: D0?,LAB_R[1]                      ; BRANCH IF TIME FOR IBA<1:0>=11
U 101E, 0000,003C,0180,0800,0000,1199           =1110  J/T115L3                           ; CONTINUE TESTING
U 101F, 0018,0014,0580,0A88,0000,1199                  R[1]_LA+K[.1],J/T115L3             ; INCREMENT IBA AGAIN



                                                ;//////////////////////////////////////////////////////////////////////
                                                ;+
                                                ; THIS SUBTEST TEST CHECKS IBA<1:0> VALUES OF 00,01, AND 11 WITH A
                                                ; DATA PATTERN OF ---00FF00FF---
                                                ;-
```

```
                                          ;3486
                                          ;3487   =0
U 11A4, 0000,003D,0180,0800,0000,130D     ;3488   T115S2: SUBTEST
U 11A5, 0018,0038,0D80,09D8,0000,11A6     ;3489           RC[0B]_K[.3]                       ; INIT THE IBA COUNTER
U 11A6, 0818,0039,6580,0800,0000,11F8     ;3490   =0      D_K[.10],CALL,J/DC0                ; SET ADR OF IB DATA
U 11A7, 0001,003C,0180,0A88,0000,11A8     ;3491           R[1]_D
U 11A8, 0000,003D,0180,0800,0000,11F3     ;3492   =0      ERLOOP
U 11A9, 0018,0038,1180,09E0,0000,11AA     ;3493   T115L6: RC[0C]_K[.4]                       ; INIT THE BYTE COUNTER
U 11AA, 2000,003D,0180,0A08,4200,1313     ;3494   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11AB, 0000,003C,0180,0A10,0000,13CE     ;3495   T115L4: LAB_R[2]                           ; GET BYTE 0=FF ADDRESS
U 13CE, 0800,003C,0180,09F0,0000,11AC     ;3496   T115L5: RC[0E]_LA,D_LA                     ; SAVE IN RC[E] AND PUT IN D REG
U 11AC, 0000,003D,0180,0800,0000,1312     ;3497   =0      CALL,J7DISPAT                      ; CHECK A BYTE
U 11AD, 001D,A000,0180,0800,0010,13CF     ;3498           ALU_Q-D,CLK.UBCC,BYTE              ; ADR OK?
U 13CF, 0000,013C,0180,0800,0000,11AE     ;3499           Z?                                 ; BRANCH IF YES
U 11AE, 0001,A03D,0180,09E8,0000,11F4     ;3500   =0      ERROR1,RC[0D]_Q,BYTE               ;
                                          ;3501
                                          ;3502   ;+
                                          ;3503   ; THE FOLLOWING CODE IS LOOP CONTROL FOR SUBTEST 2
                                          ;3504   ;-
                                          ;3505
U 11AF, C810,0038,0180,0960,0000,13D0     ;3506   SYNC33: D_RC[0C],IBC/CLR.0                 ; GET THE BYTE COUNTER
U 13D0, 0819,8000,0580,09E0,0010,13D1     ;3507           RC[0C]_D-K[.1],D_ALU,CLK.UBCC,BYTE ; INCREMENT COUNT AND CHECK
U 13D1, 0000,013C,0180,0800,0000,11B0     ;3508           Z?                                 ; BRANCH IF BYTE COUNT DONE
U 11B0, 0000,003C,0180,0800,0000,13D2     ;3509   =0      J/T115P4                           ; GO COMPLIMENT EXP ADR AND CONT
U 11B1, 0800,003C,0180,0A08,0000,13D3     ;3510           J/T115P5,D_R[1]                    ; GO INCREMENT IBA AND CONT
U 13D2, 0000,193C,0180,0800,0000,102E     ;3511   T115P4: D0?                                ; BRANCH IF TIME TO USE 00 ADR
U 102E, 0000,003C,0180,0800,0000,11AB     ;3512   =1110   J/T115L4                           ; USE FF ADDRESS
U 102F, 0000,003C,0180,0A18,0000,13CE     ;3513           LAB_R[3],J/T115L5                  ; USE 00 ADR
                                          ;3514
U 13D3, 0000,003C,5D80,0800,0000,13D4     ;3515   T115P5: KMX/.7
U 13D4, 0019,0000,5D80,0A88,0000,13D5     ;3516           R[1]_D-K[.7]                       ; INCREMENT IB DATA ADR TO NEXT PATTERN
U 13D5, 0810,0038,0180,0958,0000,13D6     ;3517           D_RC[0B]                           ; GET THE IBA COUNTER
U 13D6, 0819,8000,0580,09D8,0010,13D7     ;3518           RC[0B]_D-K[.1],D_ALU,CLK.UBCC,BYTE ; INCREMENT IBA COUNTER
U 13D7, 0000,013C,0180,0800,0000,11B2     ;3519           Z?                                 ; BRANCH IF DONE
U 11B2, 0000,003C,0180,0800,0000,13D8     ;3520   =0      J/T115P6                           ; GO CHECK IF TIME FOR IBA<1:0>=11
U 11B3, 0000,003C,0180,0800,0000,11B4     ;3521           J/T115S3                           ; GO TO NEXT SUBTEST
                                          ;3522
U 13D8, 0000,193C,0180,0A08,0000,103E     ;3523   T115P6: D0?,LAB_R[1]                       ; BRANCH IF TIME FOR IBA<1:0>=11
U 103E, 0000,003C,0180,0800,0000,11A9     ;3524   =1110   J/T115L6                           ; CONTINUE TESTING
U 103F, 0018,0014,0580,0A88,0000,11A9     ;3525           R[1]_LA+K[.1],J/T115L6             ; INCREMENT IBA AGAIN
                                          ;3526
                                          ;3527
                                          ;3528
                                          ;3529   ;///////////////////////////////////////////////////////////////////////
                                          ;3530   ;+
                                          ;3531   ; THIS SUBTEST CHECKS IBA<1:0> VALUES OF 10 WITH A DATA PATTERN OF
                                          ;3532   ; ---0000FFFF---
                                          ;3533   ;-
                                          ;3534
                                          ;3535   =0
U 11B4, 0000,003D,0180,0800,0000,130D     ;3536   T115S3: SUBTEST
U 11B5, 0000,003C,0180,0800,0000,11B6     ;3537           NOP
U 11B6, 0000,003D,0D80,0800,0084,730F     ;3538   =0      SETRCF[.3]
U 11B7, 0000,003C,0180,0800,0000,11B8     ;3539           NOP
U 11B8, 0818,0039,0580,0800,0000,11F9     ;3540   =0      D_K[.1],CALL,J/DC1                 ; GEN ADR OF IB DATA
```

```
U 11B9, 0000,003C,0180,0800,0000,11BA   ;3541            NOP
U 11BA, 0000,003D,0180,0800,0000,11FA   ;3542   =0       CALL,J/DC2
U 11BB, 0001,003C,0180,0A88,0000,11BC   ;3543            R[1]_D
U 11BC, 0000,003D,0180,0800,0000,11F3   ;3544   =0       ERLOOP
U 11BD, 0018,0038,1180,09E0,0000,11BE   ;3545   T115L9: RC[0C]_K[.4]                   ; INIT THE BYTE COUNTER
U 11BE, 2000,003D,0180,0A08,4200,1313   ;3546   =0       ALU_R[T],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11BF, 0000,003C,0180,0A18,0000,13D9   ;3547   T115L7: LAB_R[3]                       ; GET BYTE 0=00 ADDRESS
U 13D9, 0800,003C,0180,09F0,0000,11C0   ;3548   T115L8: RC[0E]_LA,D_LA                 ; SAVE IN RC[E] AND PUT IN D REG
U 11C0, 0000,003D,0180,0800,0000,1312   ;3549   =0       CALL,J7DISPAT                 ; CHECK A BYTE
U 11C1, 001D,A000,0180,0800,0010,13DA   ;3550            ALU_Q-D,CLK.UBCC,BYTE         ; ADR OK?
U 13DA, 0000,013C,0180,0800,0000,11C2   ;3551            Z?                            ; BRANCH IF YES
U 11C2, 0001,A03D,0180,09E8,0000,11F4   ;3552   =0       ERROR1,RC[0D]_Q,BYTE          ;
                                        ;3553
                                        ;3554   ;+
                                        ;3555   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST.
                                        ;3556   ;-
                                        ;3557
U 11C3, C810,0038,0180,0960,0000,13DB   ;3558   SYNC34: D_RC[0C],IBC/CLR.0              ; GET THE BYTE COUNTER
U 13DB, 0819,8000,0580,09E0,0010,13DC   ;3559            RC[0C]_D-K[.1],D_ALU,CLK.UBCC,BYTE ; INCREMENT COUNT AND CHECK
U 13DC, 0000,013C,0180,0800,0000,11C4   ;3560            Z?                            ; BRANCH IF BYTE COUNT DONE
U 11C4, 0000,003C,0180,0800,0000,13DD   ;3561   =0       J/T115P7                      ; GO COMPLIMENT EXP ADR AND CONT
U 11C5, 0000,003C,0180,0800,0000,11C6   ;3562            J/T115S4                      ; GO CHECK COMPLIMENT PATTERN
U 13DD, 0000,193C,0180,0800,0000,106C   ;3563   T115P7: D1-0?                          ; BRANCH IF TIME TO USE FF ADR
U 106C, 0000,003C,0180,0800,0000,11BF   ;3564   =1100    J/T115L7                      ; USE 00 ADDRESS
U 106D, 0000,003C,0180,0A10,0000,13D9   ;3565            LAB_R[2],J/T115L8             ; USE FF ADR
U 106E, 0000,003C,0180,0A10,0000,13D9   ;3566            LAB_R[2],J/T115L8             ; USE FF ADR
U 106F, 0000,003C,0180,0800,0000,11BF   ;3567            J/T115L7                      ; USE 00 ADR
                                        ;3568
                                        ;3569
                                        ;3570
                                        ;3571   ;///////////////////////////////////////////////////////////////////
                                        ;3572   ;+
                                        ;3573   ; THIS SUBTEST CHECKS IBA<1:0> VALUES OF 10 WITH A DATA PATTERN OF
                                        ;3574   ; ---FFFF0000---
                                        ;3575   ;-
                                        ;3576
                                        ;3577   =0
U 11C6, 0000,003D,0180,0800,0000,130D   ;3578   T115S4: SUBTEST
U 11C7, 0000,003C,0180,0800,0000,11C8   ;3579            NOP
U 11C8, 0818,0039,0580,0800,0000,11F9   ;3580   =0       D_K[.1],CALL,J/DC1
U 11C9, 0000,003C,0180,0800,0000,11CA   ;3581            NOP
U 11CA, 0000,003D,0180,0800,0000,1302   ;3582   =0       CALL,J/DCA
U 11CB, 0001,003C,0180,0A88,0000,11CC   ;3583            R[1]_D
U 11CC, 0000,003D,0180,0800,0000,11F3   ;3584   =0       ERLOOP
U 11CD, 0018,0038,1180,09E0,0000,11CE   ;3585   T115L12:RC[0C]_K[.4]                   ; INIT THE BYTE COUNTER
U 11CE, 2000,003D,0180,0A08,4200,1313   ;3586   =0       ALU_R[T],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11CF, 0000,003C,0180,0A10,0000,13DE   ;3587   T115L10:LAB_R[2]                       ; GET BYTE 0=FF ADDRESS
U 13DE, 0800,003C,0180,09F0,0000,11D0   ;3588   T115L11:RC[0E]_LA,D_LA                 ; SAVE IN RC[E] AND PUT IN D REG
U 11D0, 0000,003D,0180,0800,0000,1312   ;3589   =0       CALL,J7DISPAT                 ; CHECK A BYTE
U 11D1, 001D,A000,0180,0800,0010,13DF   ;3590            ALU_Q-D,CLK.UBCC,BYTE         ; ADR OK?
U 13DF, 0000,013C,0180,0800,0000,11D2   ;3591            Z?                            ; BRANCH IF YES
U 11D2, 0001,A03D,0180,09E8,0000,11F4   ;3592   =0       ERROR1,RC[0D]_Q,BYTE          ; BYTE ROTATOR FAILED
                                        ;3593
                                        ;3594   ;+
                                        ;3595   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST.
                                        ;3596   ;-
                                        ;3597
U 11D3, C810,0038,0180,0960,0000,13E0   ;3598   SYNC35: D_RC[OC],IBC/CLR.0              ; GET THE BYTE COUNTER
U 13E0, 0819,8000,0580,09E0,0010,13E1   ;3599           R[OC]_D-K[.1],D_ALU,CLK.UBCC,BYTE ; INCREMENT COUNT AND CHECK
U 13E1, 0000,013C,0180,0800,0000,11D4   ;3600           Z?                              ; BRANCH IF BYTE COUNT DONE
U 11D4, 0000,003C,0180,0800,0000,13E2   ;3601   =0      J/T115P9                        ; GO COMPLIMENT EXP ADR AND CONT
U 11D5, 0000,003C,0180,0800,0000,13E3   ;3602           J/T115S5                        ; GO CHECK COMPLIMENT PATTERN
U 13E2, 0000,193C,0180,0800,0000,107C   ;3603   T115P9: D1-0?                           ; BRANCH IF TIME TO USE 00 ADR
U 107C, 0000,003C,0180,0800,0000,11CF   ;3604   =1100   J/T115L10                       ; USE 00 ADDRESS
U 107D, 0000,003C,0180,0A18,0000,13DE   ;3605           LAB_R[3],J/T115L11              ; USE 00 ADR
U 107E, 0000,003C,0180,0A18,0000,13DE   ;3606           LAB_R[3],J/T115L11              ; USE 00 ADR
U 107F, 0000,003C,0180,0800,0000,11CF   ;3607           J/T115L10                       ; USE FF ADR
U 13E3, 0000,003C,0180,0800,0000,11D6   ;3608   T115S5: NOP
                                        ;3609
                                        ;3610   ; THE FOLLOWING IS THE IB DATA USED IN THE ABOVE TEST:
                                        ;3611   ;% F0
                                        ;3612   ; SUBTEST 2 -- IBA LOOP COUNT = 1
                                        ;3613   ;$ FF00,FF00,FF00,FF00
                                        ;3614   ; SUBTEST 1 -- IBA LOOP COUNT = 3, AND SUBTEST 2 IBA LOOP COUNT = 2
                                        ;3615   ;$ FF00,FF00,FF00,FF00
                                        ;3616   ; SUBTEST 1 -- IBA LOOP COUNT = 2, AND SUBTEST 2 IBA LOOP COUNT = 3
                                        ;3617   ;$ 00FF,00FF,00FF,00FF
                                        ;3618   ; SUBTEST 1 -- IBA LOOP COUNT = 1
                                        ;3619   ;$ 00FF,00FF,00FF,00FF
                                        ;3620   ; SUBTEST 3
                                        ;3621   ;$ FFFF,0000,FFFF,0000
                                        ;3622   ; SUBTEST 4
                                        ;3623   ;$ 0000,FFFF,0000,FFFF
                                        ;3624
                                        ;3625
                                        ;3626   =0
U 11D6, 0000,003D,0180,0800,0000,11DF   ;3627   T116:   NEWTST
U 11D7, 0000,003C,0180,0800,0000,11D8   ;3628           NOP
                                        ;3629   =0
U 11D8, 0000,003D,0180,0800,0000,11DF   ;3630   T117:   NEWTST
U 11D9, 0000,003C,0180,0800,0000,13E4   ;3631           NOP
U 13E4, 0000,003D,0180,0800,0000,11DF   ;3632   ENDTST: NEWTST
```

```
;Location          0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000             1876:    1845     1847=    1866=    1867=    1868=    1884=    1885=
U 1008             2333=    2334=    2335=    2336=    2337=    2338=    3464=    3465=
U 1010             2346=    2347=    2349=    2350=    2352=    2353=    2388=    2389=
U 1018             2390=    2391=    2392=    2393=    2402=    2403=    3476=    3477=
U 1020             2404=    2405=    2406=    2407=    2408=    2409=    2411=    2412=
U 1028             2419=    2426=    2427=    2428=    2429=    2430=    3512=    3513=
U 1030             2431=    2432=    2433=    2434=    2436=    2437=    2496=    2497=
U 1038             2498=    2499=    2507=    2508=    2511=    2512=    3524=    3525=
U 1040             2513=    2514=    2516=    2517=    2520=    2521=    2528=    2529=
U 1048             2531=    2532=    2533=    2534=    2536=    2537=    1920:    1846
U 1050             2539=    2540=    2547=    2548=    2550=    2551=    2552=    2553=
U 1058             2555=    2556=    1924:    1869     2558=    2559=    1928:    1870
U 1060             2567=    2568=    2570=    2571=    2572=    2573=    2575=    2576=
U 1068             2578=    2585=    2586=    2587=    3564=    3565=    3566=    3567=
U 1070             2588=    2589=    2590=    2591=    2593=    2594=    2596=    2603=
U 1078             2604=    2605=    2606=    2607=    3604=    3605=    3606=    3607=
U 1080             2608=    2609=    2611=    2612=    2614=    2621=    2622=    2623=
U 1088             2624=    2625=    2626=    2627=    2629=    2630=    2632=    2633=
U 1090             2711=    2712=    2721=    2722=    2725=    2726=    2727=    2728=
U 1098             2729=    2730=    2732=    2739=    2740=    2741=    2748=    2749=
U 10A0             2750=    2751=    2752=    2753=    2755=    2762=    2763=    2764=
U 10A8             2766=    2767=    2768=    2769=    2770=    2771=    2773=    2780=
U 10B0             2781=    2782=    2783=    2784=    2785=    2786=    2787=    2788=
U 10B8             2790=    2797=    2798=    2799=    2806=    2807=    2808=    2809=
U 10C0             2810=    2811=    2813=    2814=    2821=    2822=    2824=    2825=
U 10C8             2826=    2827=    2828=    2829=    2831=    2838=    2839=    2840=
U 10D0             2841=    2842=    2843=    2844=    2846=    2847=    2849=    2850=
U 10D8             2857=    2858=    2860=    2861=    2862=    2863=    2864=    2865=
U 10E0             2867=    2874=    2875=    2876=    2877=    2878=    2879=    2880=
U 10E8             2881=    2882=    2884=    2885=    2977=    2978=    2987=    2988=
U 10F0             2989=    2990=    2994=    2995=    3000=    3001=    3003=    3004=
U 10F8             3009=    3016=    3017=    3018=    3020=    3021=    3026=    3027=
U 1100             1831:    1832:    1833:    1834:    1835:    1836:    1837:    1838:
U 1108             1839:    1871     3031=    3032=    1840:    1841:    1842:    1843:
U 1110             3034=    3035=    3040=    3047=    3048=    3049=    3051=    3052=
U 1118             3057=    3058=    3061=    3062=    3064=    3065=    3070=    3077=
U 1120             3078=    3079=    3081=    3082=    3087=    3088=    3092=    3093=
U 1128             3095=    3096=    3101=    3108=    3109=    3110=    3112=    3113=
U 1130             3118=    3119=    3122=    3123=    3125=    3126=    3131=    3132=
U 1138             3140=    3141=    3143=    3144=    3149=    3150=    3153=    3154=
U 1140             3156=    3157=    3163=    3170=    3171=    3172=    3174=    3175=
U 1148             3179=    3180=    3184=    3185=    3187=    3188=    3193=    3200=
U 1150             3201=    3202=    3204=    3205=    1872     2198:    3209=    3210=
U 1158             3214=    3215=    3217=    3218=    3223=    3230=    3231=    3232=
U 1160             3234=    3235=    3239=    3240=    3244=    3245=    3247=    3248=
U 1168             3253=    3260=    3261=    3262=    3264=    3265=    3269=    3270=
U 1170             3274=    3275=    3277=    3278=    3283=    3291=    3292=    3293=
U 1178             3295=    3296=    3300=    3301=    3305=    3306=    3308=    3309=
U 1180             3314=    3322=    3323=    3324=    3326=    3327=    3331=    3332=
U 1188             3336=    3337=    3339=    3340=    3345=    3346=    3426=    3427=
U 1190             3428=    3429=    3430=    3431=    3432=    3433=    3442=    3443=
U 1198             3444=    3445=    3446=    3447=    3449=    3450=    3452=    3458=
;Location         0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 11A0            3461=    3462=    3472=    3473=    3488=    3489=    3490=    3491=
U 11A8            3492=    3493=    3494=    3495=    3497=    3498=    3500=    3506=
U 11B0            3509=    3510=    3520=    3521=    3536=    3537=    3538=    3539=
U 11B8            3540=    3541=    3542=    3543=    3544=    3545=    3546=    3547=
U 11C0            3549=    3550=    3552=    3558=    3561=    3562=    3578=    3579=
U 11C8            3580=    3581=    3582=    3583=    3584=    3585=    3586=    3587=
U 11D0            3589=    3590=    3592=    3598=    3601=    3602=    3627=    3628=
U 11D8            3630=    3631=    1873     1874     1875     1882     1883     1897
U 11E0            1898     1899     1900     1901     1902     1903     1904     1905
U 11E8            1906     1907     1908     1909     1910     1911     1912     1913
U 11F0            1914     1915     1916     1917     1918     1919     1922     1923
U 11F8            1966     1967     1968     1969     1970     1971     1972     1973
U 1200            2027:    2028:    2029:    2030:    2031:    2032:    2033:    2034:
U 1208            2035:    2036:    2037:    2038:    2039:    2040:    2041:    2042:
U 1210            2043:    2044:    2045:    2046:    2047:    2048:    2049:    2050:
U 1218            2051:    2052:    2053:    2054:    2055:    2056:    2057:    2058:
U 1220            2059:    2060:    2061:    2062:    2063:    2064:    2065:    2066:
U 1228            2067:    2068:    2069:    2070:    2071:    2072:    2073:    2074:
U 1230            2075:    2076:    2077:    2078:    2079:    2080:    2081:    2082:
U 1238            2083:    2084:    2085:    2086:    2087:    2088:    2089:    2090:
U 1240            2091:    2092:    2093:    2094:    2095:    2096:    2097:    2098:
U 1248            2099:    2100:    2101:    2102:    2103:    2104:    2105:    2106:
U 1250            2107:    2108:    2109:    2110:    2111:    2112:    2113:    2114:
U 1258            2115:    2116:    2117:    2118:    2119:    2120:    2121:    2122:
U 1260            2123:    2124:    2125:    2126:    2127:    2128:    2129:    2130:
U 1268            2131:    2132:    2133:    2134:    2135:    2136:    2137:    2138:
U 1270            2139:    2140:    2141:    2142:    2143:    2144:    2145:    2146:
U 1278            2147:    2148:    2149:    2150:    2151:    2152:    2153:    2154:
U 1280            2155:    2156:    2157:    2158:    2159:    2160:    2161:    2162:
U 1288            2163:    2164:    2165:    2166:    2167:    2168:    2169:    2170:
U 1290            2171:    2172:    2173:    2174:    2175:    2176:    2177:    2178:
U 1298            2179:    2180:    2181:    2182:    2183:    2184:    2185:    2186:
U 12A0            2187:    2188:    2189:    2190:    2191:    2192:    2193:    2194:
U 12A8            2195:    2196:    2197:    2200:    2201:    2202:    2203:    2204:
U 12B0            2205:    2206:    2207:    2208:    2209:    2210:    2211:    2212:
U 12B8            2213:    2214:    2215:    2216:    2217:    2218:    2219:    2220:
U 12C0            2221:    2222:    2223:    2224:    2225:    2226:    2227:    2228:
U 12C8            2229:    2230:    2231:    2232:    2233:    2234:    2235:    2236:
U 12D0            2237:    2238:    2239:    2240:    2241:    2242:    2243:    2244:
U 12D8            2245:    2246:    2247:    2248:    2249:    2250:    2251:    2252:
U 12E0            2253:    2254:    2255:    2256:    2257:    2258:    2259:    2260:
U 12E8            2261:    2262:    2263:    2264:    2265:    2266:    2267:    2268:
U 12F0            2269:    2270:    2271:    2272:    2273:    2274:    2275:    2276:
U 12F8            2277:    2278:    2279:    2280:    2281:    2282:    2283:    2284:
U 1300            1974     1975     1976     1977     1978     1979     1980     1981
U 1308            1983     1984     1985     1986     1988     1998     1999     2007
U 1310            2008     2009     2022     2297     2298     2299     2300     2301
U 1318            2302     2303     2348     2351     2394     2410     2413     2414
U 1320            2415     2416     2417     2418     2435     2509     2510     2518
U 1328            2519     2538     2557     2577     2595     2613     2631     2713
U 1330            2723     2724     2731     2742     2743     2745     2746     2747
U 1338            2754     2772     2789     2800     2801     2803     2804     2805
U 1340            2812     2830     2845     2848     2866     2883     2979     2991
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348           2992    2993    2996    2997    2998    3002    3005    3006
U 1350           3007    3008    3022    3023    3024    3025    3028    3029
U 1358           3033    3036    3037    3038    3039    3053    3054    3055
U 1360           3056    3059    3063    3066    3067    3068    3069    3083
U 1368           3084    3085    3086    3089    3090    3094    3097    3098
U 1370           3099    3100    3114    3115    3116    3117    3120    3124
U 1378           3127    3128    3129    3130    3145    3146    3147    3148
U 1380           3151    3155    3158    3159    3160    3161    3162    3176
U 1388           3177    3178    3181    3182    3186    3189    3190    3191
U 1390           3192    3206    3207    3208    3211    3212    3216    3219
U 1398           3220    3221    3222    3236    3237    3238    3241    3242
U 13A0           3246    3249    3250    3251    3252    3266    3267    3268
U 13A8           3271    3272    3276    3279    3280    3281    3282    3297
U 13B0           3298    3299    3302    3303    3307    3310    3311    3312
U 13B8           3313    3328    3329    3330    3333    3334    3338    3341
U 13C0           3342    3343    3344    3448    3451    3459    3460    3463
U 13C8           3467    3468    3469    3470    3471    3475    3496    3499
U 13D0           3507    3508    3511    3515    3516    3517    3518    3519
U 13D8           3523    3548    3551    3559    3560    3563    3588    3591
U 13E0           3599    3600    3603    3608    3632
U 13E8 - 13EF Unused
U 13F0           1934:   1935:   1936:   1937:   1938:   1939:   1940:   1941:
U 13F8           1942:   1943:   1944:   1945:   1946:   1947:   1948:   1949:
```

```
           Words not
           in bounds
 ESK00DEF         0
 ESK00MAC         0
 ESKAHMAC         0
  ESKAH33      1013

Used           1013
Remaining

Total microwords used in memory U: 1013
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH33.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 2342  TEST 118        SHIFT MULTIPLEXOR DATA INTEGRITY
; 3192  TEST 119        VALID BIT GENERATION
```

```
                                        ;1          .NOLIST
                                        ;1804       .LIST
                                        ;1805
```

```
                                             ;1806   .REGION/1000,13FF
                                             ;1807
                                             ;1808   ;+
                                             ;1809   ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                             ;1810   ; WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
                                             ;1811   ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                             ;1812   ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                             ;1813   ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                             ;1814   ;
                                             ;1815   ; FOR EXAMPLE: IF A TEST EXPECTED A ''TB MISS'' MICRO TRAP IT WOULD SET BIT
                                             ;1816   ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                             ;1817   ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                             ;1818   ;       R[OF] AND DO A RETURNO.
                                             ;1819   ;
                                             ;1820   ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                             ;1821   ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                             ;1822   ; TO THE CONSOLE.
                                             ;1823   ;
                                             ;1824   ; THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
                                             ;1825   ; ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURNO IF THE TRAP WAS
                                             ;1826   ; EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
                                             ;1827   ; RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
                                             ;1828   ; STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.
                                             ;1829   ;-
                                             ;1830
U 1100, 0000,003C,19C0,0A78,0084,7001        ;1831   1100:   SC_K[ZERO],Q_R[OF],J/TRPHO      ; SYSTEM INIT
U 1101, 0000,003C,05C0,0A78,0084,7001        ;1832   1101:   SC_K[.1],Q_R[OF],J/TRPHO        ; DATA UNALIGNED
U 1102, 0000,003C,09C0,0A78,0084,7001        ;1833   1102:   SC_K[.2],Q_R[OF],J/TRPHO        ; X PAGE ERROR
U 1103, 0000,003C,0DC0,0A78,0084,7001        ;1834   1103:   SC_K[.3],Q_R[OF],J/TRPHO        ; TB MODIFY
U 1104, 0000,003C,11C0,0A78,0084,7001        ;1835   1104:   SC_K[.4],Q_R[OF],J/TRPHO        ; TB PROT ERROR
U 1105, 0000,003C,D5C0,0A78,0084,7001        ;1836   1105:   SC_K[.6],Q_R[OF],J/TRPHO        ; TB MISS
U 1106, 0000,003C,D9C0,0A78,0084,7001        ;1837   1106:   SC_K[.9],Q_R[OF],J/TRPHO        ; RES FLOAT OPER
U 1107, 0000,003C,5DC0,0A78,0084,7001        ;1838   1107:   SC_K[.7],Q_R[OF],J/TRPHO        ; TB PARITY
U 1108, 0000,003C,01C0,0A78,0084,7001        ;1839   1108:   SC_K[.8],Q_R[OF],J/TRPHO        ; CACHE PARITY
U 110C, 0000,003C,85C0,0A78,0084,7001        ;1840   110C:   SC_K[.C],Q_R[OF],J/TRPHO        ; RDS
U 110D, 0000,003C,89C0,0A78,0084,7001        ;1841   110D:   SC_K[.D],Q_R[OF],J/TRPHO        ; TIME OUT
U 110E, 0000,003C,65C0,0A78,0084,7001        ;1842   110E:   SC_K[.10],Q_R[OF],J/TRPHO       ; ODD ADDRESS
U 110F, 0000,003C,61C0,0A78,0084,704F        ;1843   110F:   SC_K[.F],Q_R[OF],J/TRPH2        ; CS PARITY
                                             ;1844
U 1001, 0001,2024,0180,0800,0010,1006        ;1845   TRPHO:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 1006, 0000,013C,0180,0800,0000,1002        ;1846           Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000        ;1847   =0      ALU_Q[AND]MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN
                                             ;1848
                                             ;1849
                                             ;1850   ;+
                                             ;1851   ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                             ;1852   ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                             ;1853   ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                             ;1854   ;
                                             ;1855   ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                             ;1856   ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                             ;1857   ;             FAULT STATUS REGISTER
                                             ;1858   ;             SBI ERROR REGISTER
                                             ;1859   ;             TIMEOUT ADDRESS REGISTER
                                             ;1860   ;             MAINTENANCE REGISTER
```

```
                                            ;1861   ;               CACHE PARITY REGISTER
                                            ;1862   ;               TB ERROR REGISTER 1
                                            ;1863   ;               TB ERROR REGISTER 0
                                            ;1864   ;-
                                            ;1865
U 1003, 0018,0038,1D80,09E8,0000,1004       ;1866   TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,7351       ;1867   =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,100E       ;1868           Q_ID[TBER0]
U 100E, 0001,203C,4DF0,2DB0,0000,1016       ;1869           RC[6]_Q,Q_ID[TBER1]
U 1016, 0001,203C,65F0,2DB8,0000,101E       ;1870           RC[7]_Q,Q_ID[SBI.ERR]
U 101E, 0001,203C,6DF0,2DD8,0000,1026       ;1871           RC[0B]_Q,Q_ID[FAULT]
U 1026, 0001,203C,75F0,2DE0,0000,102E       ;1872           RC[0C]_Q,Q_ID[MAINT]
U 102E, 0001,203C,79F0,2DC8,0000,1036       ;1873           RC[9]_Q,Q_ID[PARITY]
U 1036, 0001,203C,69F0,2DC0,0000,103E       ;1874           RC[8]_Q,Q_ID[TIME.ADDR]
U 103E, 0001,203C,81F0,2DD0,0000,1000       ;1875           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1336       ;1876   1000:   RC[0E]_Q,ERROR1
                                            ;1877
                                            ;1878   ;+
                                            ;1879   ; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
                                            ;1880   ;-
                                            ;1881
U 104F, 0001,2024,0180,0800,0010,105B       ;1882   TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC        ; WAS THE TRAP EXPECTED?
U 105B, 0000,013C,0180,0800,0000,1008       ;1883           Z?                                ; BRANCH IF NO
U 1008, 0001,2036,0180,0AF8,0000,0001       ;1884   =0      ALU_Q[AND]MASK,R[0F]_ALU,RETURN1  ; RETURN
U 1009, 0000,003C,0180,0800,0000,1003       ;1885           J/TRPH1                           ; REPORT UNEXPECTED TRAP
                                            ;1886
                                            ;1887
                                            ;1888   ;+
                                            ;1889   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                            ;1890   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                            ;1891   ;                 NEWTST
                                            ;1892   ;                 ERLOOP
                                            ;1893   ;                 ERROR1
                                            ;1894   ;                 ERROR2
                                            ;1895   ;
                                            ;1896
U 105F, 0000,003C,65F8,0800,0084,7109       ;1897   SCOPE:  SC_K[.10],Q_0                     ; SETUP TO WRITE IPL OF 1F
U 1109, 0818,0038,8D80,0800,0000,1154       ;1898           D_K[.1F]                          ; ...
U 1154, 0D00,003C,0180,0800,0000,1324       ;1899           D_DAL.SC
U 1324, 0000,003C,3D80,3C00,0000,1325       ;1900           ID[PSL]_D                         ; WRITE THE PSL
U 1325, 0818,0038,0580,0800,0000,1326       ;1901           D_K[.1]                           ; SETUP TO CLEAR THE CES REGISTER
U 1326, 0D00,003C,0180,0800,0000,1327       ;1902           D_DAL.SC
U 1327, 0F00,003C,3180,3C00,0000,1328       ;1903           ID[CES]_D,D_0                     ; CLEAR THE CES REGISTER
U 1328, 0000,003C,5D80,3C00,0000,1329       ;1904           ID[ACC.CS]_D                      ; SHUT OFF THE FLOATING POINT
U 1329, 0000,003C,3980,3C00,0000,132A       ;1905           ID[SIR]_D                         ; CLEAR THE SIR REGISTER
U 132A, 0000,003C,2980,3C00,0000,132B       ;1906           ID[CLK.CS]_D                      ; STOP INTERVAL TIMER
U 132B, 0000,003C,4980,3C00,0000,132C       ;1907           ID[TBER0]_D                       ; SHUT OFF THE TB
U 132C, 0000,003C,7180,3C00,0000,132D       ;1908           ID[COMP]_D                        ; CLEAR SILO COMPARATOR
U 132D, 0818,0038,C180,0800,0000,132E       ;1909           D_K[.FFFF]
U 132E, 0000,003C,6580,3C00,0000,132F       ;1910           ID[SBI.ERR]_D
U 132F, 0F00,003C,6D80,3C00,0000,1330       ;1911           ID[FAULT]_D,D_0
U 1330, 0000,003C,6D80,3C00,0000,1331       ;1912           ID[FAULT]_D
U 1331, 0000,003C,6580,3C00,0000,1332       ;1913           ID[SBI.ERR]_D
U 1332, 0003,003C,0180,09F0,0000,1333       ;1914           RC[0E]_0
U 1333, 0003,003C,0180,0AF8,0000,1334       ;1915           R[0F]_0
```

```
U 1334, 0003,003C,0180,09E8,0000,105E   ;1916           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 1335, 0818,0038,0980,0800,0000,105E   ;1917   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 1336, 0810,0038,0180,0978,0000,1337   ;1918   ERROR1: D_RC[0F]
U 1337, 0819,0034,4D80,0800,0000,104E   ;1919           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1920   104E:   D_D.OR.K[.4],J/CALLCON
                                        ;1921
U 1338, 0810,0038,0180,0978,0000,1339   ;1922   ERROR2: D_RC[0F]
U 1339, 0819,0034,4D80,0800,0000,105A   ;1923           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1924   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1925
                                        ;1926   105E:
                                        ;1927   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1928           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1929
                                        ;1930   ;+
                                        ;1931   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1932   ;-
                                        ;1933
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1934   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1935   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1936   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1937   13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1938   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1939   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1940   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1941   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1942   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1943   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1944   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1945   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1946   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1947   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1948   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,133A   ;1949   13FF:   NOP
                                        ;1950
                                        ;1951
                                        ;1952   ;+
                                        ;1953   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
                                        ;1954   ; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
                                        ;1955   ; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
                                        ;1956   ; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
                                        ;1957   ;
                                        ;1958   ; FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
                                        ;1959   ;       THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
                                        ;1960   ;
                                        ;1961   ;               =0      D_0,CALL,J/DC5
                                        ;1962   ;                       NOP
                                        ;1963   ;               =0      CALL,J/DC5
                                        ;1964   ;-
                                        ;1965
U 133A, 0018,0038,1980,0800,0000,134A   ;1966   DC0:    ALU_0(K),J/S00
U 133B, 0018,0038,1980,0800,0000,134B   ;1967   DC1:    ALU_0(K),J/S01
U 133C, 0018,0038,1980,0800,0000,134C   ;1968   DC2:    ALU_0(K),J/S10
U 133D, 0018,0038,1980,0800,0000,134D   ;1969   DC3:    ALU_0(K),J/S11
U 133E, 0018,0038,0980,0800,0000,134A   ;1970   DC4:    ALU_K[.2],J/S00
```

```
U 133F, 0018,0038,0980,0800,0000,134B     DC5:    ALU_K[.2],J/S01
U 1340, 0018,0038,0980,0800,0000,134C     DC6:    ALU_K[.2],J/S10
U 1341, 0018,0038,0980,0800,0000,134D     DC7:    ALU_K[.2],J/S11
U 1342, 0018,0038,0580,0800,0000,134A     DC8:    ALU_K[.1],J/S00
U 1343, 0018,0038,0580,0800,0000,134B     DC9:    ALU_K[.1],J/S01
U 1344, 0018,0038,0580,0800,0000,134C     DCA:    ALU_K[.1],J/S10
U 1345, 0018,0038,0580,0800,0000,134D     DCB:    ALU_K[.1],J/S11
U 1346, 0018,0038,C180,0800,0000,134A     DCC:    ALU_K[.FFFF],J/S00
U 1347, 0018,0038,C180,0800,0000,134B     DCD:    ALU_K[.FFFF],J/S01
U 1348, 0018,0038,C180,0800,0000,134C     DCE:    ALU_K[.FFFF],J/S10
U 1349, 0018,0038,C180,0800,0000,134D     DCF:    ALU_K[.FFFF],J/S11

U 134A, 0118,0038,1B80,0800,0000,134E     S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 134B, 0118,0038,0B80,0800,0000,134E     S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 134C, 0118,0038,0780,0800,0000,134E     S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 134D, 0118,0038,C380,0800,0000,134E     S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX

U 134E, 0100,003E,0380,0800,0000,0001     SX:     D_D.LEFT2,SI/7,RETURN1          ; EXIT



                                          ;+
                                          ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                          ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                          ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                          ; TYPING IT.
                                          ;-

U 134F, 0810,0038,4D80,0978,0000,1350     SUBTST: D_RC[OF],KMX/.FF00
U 1350, 0019,4016,4D80,09F8,0000,0001             RC[OF]_D+K[.FF00],WORD,RETURN1

                                          ;+
                                          ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                          ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                          ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                          ;-

U 1351, 0010,0038,01C0,0978,0000,1352     SETRCF: Q_RC[OF]
U 1352, 0019,2034,4DC0,0800,0000,1353             Q_Q.AND.K[.FF00]
U 1353, 0019,2032,1D80,09F8,0000,0001             RC[OF]_Q.OR.SC,RETURN1
U 1155, 0019,2000,05C0,0800,0000,12AB     1155:   Q_Q-K[.1],J/12AB
                                          ;+
                                          ; THE FOLLOWING TWO SUBROUTINES ARE USED BY THE "SHIFT MUX DATA INTEGRITY
                                          ; TEST" TO SETUP A ZERO BYTE IN A FIELD OF ALL ONE'S BYTES, AND AN ALL
                                          ; ONE'S BYTE IN A FIELD OF ZERO'S BYTES.
                                          ;-

                                          SETUP00:
U 1354, 0018,0000,6580,0A88,0000,1355             R[1]_LA-K[.10]                  ; DECREMENT IB ADDRESS
U 1355, 0F00,003C,0180,0A00,0200,1356             VA_R[0],D_0                     ; LOAD ADDRESS OF BYTE TO WRITE
                                                                                  ; WITH A ZERO
U 1356, 0000,803C,0180,A800,0000,1357             CACHE.P_D[BYTE]                 ; WRITE IT
U 1357, 0018,0038,0180,0800,0200,1358             VA_K[.8]                        ; RESTORE THE ONE'S BYTE IN THE FIELD
U 1358, 0000,003C,0180,A800,0000,1359             CACHE.P_D[LONG]                 ; OF ALL ZERO BYTES
U 1359, 0018,003A,8580,0800,0200,0001             VA_K[.C],RETURN1                ; ...
```

```
                                                 ;2026    SETUPFF:
U 135A, 0018,0014,0180,0A88,0000,135B            ;2027            R[1]_LA+K[.8]                   ; INCREMENT IB ADDRESS TO FIELD OF ALL ZEROS
U 135B, 0000,003C,0180,0A00,0000,135C            ;2028            LAB_R[0]
U 135C, 0018,0014,0180,0800,0200,135D            ;2029            VA_[A+K[.8]                     ; LOAD BYTE ADDRESS TO WRITE ALL ONES
U 135D, 081B,0000,0580,0800,0000,135E            ;2030            D_0-K[.1]                       ; GET ALL ONES DATA
U 135E, 0000,803C,0180,A800,0000,135F            ;2031            CACHE.P_D[BYTE]                 ; WRITE THE BYTE
U 135F, 0018,0038,1980,0800,0200,1360            ;2032            VA_K[ZERO]                      ; LOAD ADDRESS TO RESTORE FIELD OF ALL ONES
U 1360, 0000,003C,0180,A800,0000,1361            ;2033            CACHE.P_D[LONG]
U 1361, 0018,0038,1180,0800,0200,1362            ;2034            VA_K[.4]
U 1362, 0000,003E,0180,AA20,0000,0001            ;2035            CACHE.P_D[LONG],LAB_R[4],RETURN1
                                                 ;2036
                                                 ;2037
                                                 ;2038    ;+
                                                 ;2039    ; THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
                                                 ;2040    ; THE INSTRUCTION AT LOCATION "DISPAT" LOADS THE Q REGISTER WITH HEX 100
                                                 ;2041    ; AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
                                                 ;2042    ; THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
                                                 ;2043    ; THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
                                                 ;2044    ; THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.
                                                 ;2045    ;-
                                                 ;2046
                                                 ;2047    SYNC00:
U 1363, 0038,003B,41C0,0800,0000,1200            ;2048    DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/DISPATTBL
                                                 ;2049
                                                 ;2050
                                                 ;2051    1200:
                                                 ;2052    DISPATTBL:
U 1200, 0019,2000,05C0,0800,0000,1201            ;2053    1200:   Q_Q-K[.1]
U 1201, 0019,2000,05C0,0800,0000,1202            ;2054    1201:   Q_Q-K[.1]
U 1202, 0019,2000,05C0,0800,0000,1203            ;2055    1202:   Q_Q-K[.1]
U 1203, 0019,2000,05C0,0800,0000,1204            ;2056    1203:   Q_Q-K[.1]
U 1204, 0019,2000,05C0,0800,0000,1205            ;2057    1204:   Q_Q-K[.1]
U 1205, 0019,2000,05C0,0800,0000,1206            ;2058    1205:   Q_Q-K[.1]
U 1206, 0019,2000,05C0,0800,0000,1207            ;2059    1206:   Q_Q-K[.1]
U 1207, 0019,2000,05C0,0800,0000,1208            ;2060    1207:   Q_Q-K[.1]
U 1208, 0019,2000,05C0,0800,0000,1209            ;2061    1208:   Q_Q-K[.1]
U 1209, 0019,2000,05C0,0800,0000,120A            ;2062    1209:   Q_Q-K[.1]
U 120A, 0019,2000,05C0,0800,0000,120B            ;2063    120A:   Q_Q-K[.1]
U 120B, 0019,2000,05C0,0800,0000,120C            ;2064    120B:   Q_Q-K[.1]
U 120C, 0019,2000,05C0,0800,0000,120D            ;2065    120C:   Q_Q-K[.1]
U 120D, 0019,2000,05C0,0800,0000,120E            ;2066    120D:   Q_Q-K[.1]
U 120E, 0019,2000,05C0,0800,0000,120F            ;2067    120E:   Q_Q-K[.1]
U 120F, 0019,2000,05C0,0800,0000,1210            ;2068    120F:   Q_Q-K[.1]
U 1210, 0019,2000,05C0,0800,0000,1211            ;2069    1210:   Q_Q-K[.1]
U 1211, 0019,2000,05C0,0800,0000,1212            ;2070    1211:   Q_Q-K[.1]
U 1212, 0019,2000,05C0,0800,0000,1213            ;2071    1212:   Q_Q-K[.1]
U 1213, 0019,2000,05C0,0800,0000,1214            ;2072    1213:   Q_Q-K[.1]
U 1214, 0019,2000,05C0,0800,0000,1215            ;2073    1214:   Q_Q-K[.1]
U 1215, 0019,2000,05C0,0800,0000,1216            ;2074    1215:   Q_Q-K[.1]
U 1216, 0019,2000,05C0,0800,0000,1217            ;2075    1216:   Q_Q-K[.1]
U 1217, 0019,2000,05C0,0800,0000,1218            ;2076    1217:   Q_Q-K[.1]
U 1218, 0019,2000,05C0,0800,0000,1219            ;2077    1218:   Q_Q-K[.1]
U 1219, 0019,2000,05C0,0800,0000,121A            ;2078    1219:   Q_Q-K[.1]
U 121A, 0019,2000,05C0,0800,0000,121B            ;2079    121A:   Q_Q-K[.1]
U 121B, 0019,2000,05C0,0800,0000,121C            ;2080    121B:   Q_Q-K[.1]
```

```
U 121C, 0019,2000,05C0,0800,0000,121D   ;2081    121C:     Q_Q-K[.1]
U 121D, 0019,2000,05C0,0800,0000,121E   ;2082    121D:     Q_Q-K[.1]
U 121E, 0019,2000,05C0,0800,0000,121F   ;2083    121E:     Q_Q-K[.1]
U 121F, 0019,2000,05C0,0800,0000,1220   ;2084    121F:     Q_Q-K[.1]
U 1220, 0019,2000,05C0,0800,0000,1221   ;2085    1220:     Q_Q-K[.1]
U 1221, 0019,2000,05C0,0800,0000,1222   ;2086    1221:     Q_Q-K[.1]
U 1222, 0019,2000,05C0,0800,0000,1223   ;2087    1222:     Q_Q-K[.1]
U 1223, 0019,2000,05C0,0800,0000,1224   ;2088    1223:     Q_Q-K[.1]
U 1224, 0019,2000,05C0,0800,0000,1225   ;2089    1224:     Q_Q-K[.1]
U 1225, 0019,2000,05C0,0800,0000,1226   ;2090    1225:     Q_Q-K[.1]
U 1226, 0019,2000,05C0,0800,0000,1227   ;2091    1226:     Q_Q-K[.1]
U 1227, 0019,2000,05C0,0800,0000,1228   ;2092    1227:     Q_Q-K[.1]
U 1228, 0019,2000,05C0,0800,0000,1229   ;2093    1228:     Q_Q-K[.1]
U 1229, 0019,2000,05C0,0800,0000,122A   ;2094    1229:     Q_Q-K[.1]
U 122A, 0019,2000,05C0,0800,0000,122B   ;2095    122A:     Q_Q-K[.1]
U 122B, 0019,2000,05C0,0800,0000,122C   ;2096    122B:     Q_Q-K[.1]
U 122C, 0019,2000,05C0,0800,0000,122D   ;2097    122C:     Q_Q-K[.1]
U 122D, 0019,2000,05C0,0800,0000,122E   ;2098    122D:     Q_Q-K[.1]
U 122E, 0019,2000,05C0,0800,0000,122F   ;2099    122E:     Q_Q-K[.1]
U 122F, 0019,2000,05C0,0800,0000,1230   ;2100    122F:     Q_Q-K[.1]
U 1230, 0019,2000,05C0,0800,0000,1231   ;2101    1230:     Q_Q-K[.1]
U 1231, 0019,2000,05C0,0800,0000,1232   ;2102    1231:     Q_Q-K[.1]
U 1232, 0019,2000,05C0,0800,0000,1233   ;2103    1232:     Q_Q-K[.1]
U 1233, 0019,2000,05C0,0800,0000,1234   ;2104    1233:     Q_Q-K[.1]
U 1234, 0019,2000,05C0,0800,0000,1235   ;2105    1234:     Q_Q-K[.1]
U 1235, 0019,2000,05C0,0800,0000,1236   ;2106    1235:     Q_Q-K[.1]
U 1236, 0019,2000,05C0,0800,0000,1237   ;2107    1236:     Q_Q-K[.1]
U 1237, 0019,2000,05C0,0800,0000,1238   ;2108    1237:     Q_Q-K[.1]
U 1238, 0019,2000,05C0,0800,0000,1239   ;2109    1238:     Q_Q-K[.1]
U 1239, 0019,2000,05C0,0800,0000,123A   ;2110    1239:     Q_Q-K[.1]
U 123A, 0019,2000,05C0,0800,0000,123B   ;2111    123A:     Q_Q-K[.1]
U 123B, 0019,2000,05C0,0800,0000,123C   ;2112    123B:     Q_Q-K[.1]
U 123C, 0019,2000,05C0,0800,0000,123D   ;2113    123C:     Q_Q-K[.1]
U 123D, 0019,2000,05C0,0800,0000,123E   ;2114    123D:     Q_Q-K[.1]
U 123E, 0019,2000,05C0,0800,0000,123F   ;2115    123E:     Q_Q-K[.1]
U 123F, 0019,2000,05C0,0800,0000,1240   ;2116    123F:     Q_Q-K[.1]
U 1240, 0019,2000,05C0,0800,0000,1241   ;2117    1240:     Q_Q-K[.1]
U 1241, 0019,2000,05C0,0800,0000,1242   ;2118    1241:     Q_Q-K[.1]
U 1242, 0019,2000,05C0,0800,0000,1243   ;2119    1242:     Q_Q-K[.1]
U 1243, 0019,2000,05C0,0800,0000,1244   ;2120    1243:     Q_Q-K[.1]
U 1244, 0019,2000,05C0,0800,0000,1245   ;2121    1244:     Q_Q-K[.1]
U 1245, 0019,2000,05C0,0800,0000,1246   ;2122    1245:     Q_Q-K[.1]
U 1246, 0019,2000,05C0,0800,0000,1247   ;2123    1246:     Q_Q-K[.1]
U 1247, 0019,2000,05C0,0800,0000,1248   ;2124    1247:     Q_Q-K[.1]
U 1248, 0019,2000,05C0,0800,0000,1249   ;2125    1248:     Q_Q-K[.1]
U 1249, 0019,2000,05C0,0800,0000,124A   ;2126    1249:     Q_Q-K[.1]
U 124A, 0019,2000,05C0,0800,0000,124B   ;2127    124A:     Q_Q-K[.1]
U 124B, 0019,2000,05C0,0800,0000,124C   ;2128    124B:     Q_Q-K[.1]
U 124C, 0019,2000,05C0,0800,0000,124D   ;2129    124C:     Q_Q-K[.1]
U 124D, 0019,2000,05C0,0800,0000,124E   ;2130    124D:     Q_Q-K[.1]
U 124E, 0019,2000,05C0,0800,0000,124F   ;2131    124E:     Q_Q-K[.1]
U 124F, 0019,2000,05C0,0800,0000,1250   ;2132    124F:     Q_Q-K[.1]
U 1250, 0019,2000,05C0,0800,0000,1251   ;2133    1250:     Q_Q-K[.1]
U 1251, 0019,2000,05C0,0800,0000,1252   ;2134    1251:     Q_Q-K[.1]
U 1252, 0019,2000,05C0,0800,0000,1253   ;2135    1252:     Q_Q-K[.1]
```

```
U 1253, 0019,2000,05C0,0800,0000,1254   ;2136   1253:   Q_Q-K[.1]
U 1254, 0019,2000,05C0,0800,0000,1255   ;2137   1254:   Q_Q-K[.1]
U 1255, 0019,2000,05C0,0800,0000,1256   ;2138   1255:   Q_Q-K[.1]
U 1256, 0019,2000,05C0,0800,0000,1257   ;2139   1256:   Q_Q-K[.1]
U 1257, 0019,2000,05C0,0800,0000,1258   ;2140   1257:   Q_Q-K[.1]
U 1258, 0019,2000,05C0,0800,0000,1259   ;2141   1258:   Q_Q-K[.1]
U 1259, 0019,2000,05C0,0800,0000,125A   ;2142   1259:   Q_Q-K[.1]
U 125A, 0019,2000,05C0,0800,0000,125B   ;2143   125A:   Q_Q-K[.1]
U 125B, 0019,2000,05C0,0800,0000,125C   ;2144   125B:   Q_Q-K[.1]
U 125C, 0019,2000,05C0,0800,0000,125D   ;2145   125C:   Q_Q-K[.1]
U 125D, 0019,2000,05C0,0800,0000,125E   ;2146   125D:   Q_Q-K[.1]
U 125E, 0019,2000,05C0,0800,0000,125F   ;2147   125E:   Q_Q-K[.1]
U 125F, 0019,2000,05C0,0800,0000,1260   ;2148   125F:   Q_Q-K[.1]
U 1260, 0019,2000,05C0,0800,0000,1261   ;2149   1260:   Q_Q-K[.1]
U 1261, 0019,2000,05C0,0800,0000,1262   ;2150   1261:   Q_Q-K[.1]
U 1262, 0019,2000,05C0,0800,0000,1263   ;2151   1262:   Q_Q-K[.1]
U 1263, 0019,2000,05C0,0800,0000,1264   ;2152   1263:   Q_Q-K[.1]
U 1264, 0019,2000,05C0,0800,0000,1265   ;2153   1264:   Q_Q-K[.1]
U 1265, 0019,2000,05C0,0800,0000,1266   ;2154   1265:   Q_Q-K[.1]
U 1266, 0019,2000,05C0,0800,0000,1267   ;2155   1266:   Q_Q-K[.1]
U 1267, 0019,2000,05C0,0800,0000,1268   ;2156   1267:   Q_Q-K[.1]
U 1268, 0019,2000,05C0,0800,0000,1269   ;2157   1268:   Q_Q-K[.1]
U 1269, 0019,2000,05C0,0800,0000,126A   ;2158   1269:   Q_Q-K[.1]
U 126A, 0019,2000,05C0,0800,0000,126B   ;2159   126A:   Q_Q-K[.1]
U 126B, 0019,2000,05C0,0800,0000,126C   ;2160   126B:   Q_Q-K[.1]
U 126C, 0019,2000,05C0,0800,0000,126D   ;2161   126C:   Q_Q-K[.1]
U 126D, 0019,2000,05C0,0800,0000,126E   ;2162   126D:   Q_Q-K[.1]
U 126E, 0019,2000,05C0,0800,0000,126F   ;2163   126E:   Q_Q-K[.1]
U 126F, 0019,2000,05C0,0800,0000,1270   ;2164   126F:   Q_Q-K[.1]
U 1270, 0019,2000,05C0,0800,0000,1271   ;2165   1270:   Q_Q-K[.1]
U 1271, 0019,2000,05C0,0800,0000,1272   ;2166   1271:   Q_Q-K[.1]
U 1272, 0019,2000,05C0,0800,0000,1273   ;2167   1272:   Q_Q-K[.1]
U 1273, 0019,2000,05C0,0800,0000,1274   ;2168   1273:   Q_Q-K[.1]
U 1274, 0019,2000,05C0,0800,0000,1275   ;2169   1274:   Q_Q-K[.1]
U 1275, 0019,2000,05C0,0800,0000,1276   ;2170   1275:   Q_Q-K[.1]
U 1276, 0019,2000,05C0,0800,0000,1277   ;2171   1276:   Q_Q-K[.1]
U 1277, 0019,2000,05C0,0800,0000,1278   ;2172   1277:   Q_Q-K[.1]
U 1278, 0019,2000,05C0,0800,0000,1279   ;2173   1278:   Q_Q-K[.1]
U 1279, 0019,2000,05C0,0800,0000,127A   ;2174   1279:   Q_Q-K[.1]
U 127A, 0019,2000,05C0,0800,0000,127B   ;2175   127A:   Q_Q-K[.1]
U 127B, 0019,2000,05C0,0800,0000,127C   ;2176   127B:   Q_Q-K[.1]
U 127C, 0019,2000,05C0,0800,0000,127D   ;2177   127C:   Q_Q-K[.1]
U 127D, 0019,2000,05C0,0800,0000,127E   ;2178   127D:   Q_Q-K[.1]
U 127E, 0019,2000,05C0,0800,0000,127F   ;2179   127E:   Q_Q-K[.1]
U 127F, 0019,2000,05C0,0800,0000,1280   ;2180   127F:   Q_Q-K[.1]
U 1280, 0019,2000,05C0,0800,0000,1281   ;2181   1280:   Q_Q-K[.1]
U 1281, 0019,2000,05C0,0800,0000,1282   ;2182   1281:   Q_Q-K[.1]
U 1282, 0019,2000,05C0,0800,0000,1283   ;2183   1282:   Q_Q-K[.1]
U 1283, 0019,2000,05C0,0800,0000,1284   ;2184   1283:   Q_Q-K[.1]
U 1284, 0019,2000,05C0,0800,0000,1285   ;2185   1284:   Q_Q-K[.1]
U 1285, 0019,2000,05C0,0800,0000,1286   ;2186   1285:   Q_Q-K[.1]
U 1286, 0019,2000,05C0,0800,0000,1287   ;2187   1286:   Q_Q-K[.1]
U 1287, 0019,2000,05C0,0800,0000,1288   ;2188   1287:   Q_Q-K[.1]
U 1288, 0019,2000,05C0,0800,0000,1289   ;2189   1288:   Q_Q-K[.1]
U 1289, 0019,2000,05C0,0800,0000,128A   ;2190   1289:   Q_Q-K[.1]
```

```
U 128A, 0019,2000,05C0,0800,0000,128B   ;2191   128A:   Q_Q-K[.1]
U 128B, 0019,2000,05C0,0800,0000,128C   ;2192   128B:   Q_Q-K[.1]
U 128C, 0019,2000,05C0,0800,0000,128D   ;2193   128C:   Q_Q-K[.1]
U 128D, 0019,2000,05C0,0800,0000,128E   ;2194   128D:   Q_Q-K[.1]
U 128E, 0019,2000,05C0,0800,0000,128F   ;2195   128E:   Q_Q-K[.1]
U 128F, 0019,2000,05C0,0800,0000,1290   ;2196   128F:   Q_Q-K[.1]
U 1290, 0019,2000,05C0,0800,0000,1291   ;2197   1290:   Q_Q-K[.1]
U 1291, 0019,2000,05C0,0800,0000,1292   ;2198   1291:   Q_Q-K[.1]
U 1292, 0019,2000,05C0,0800,0000,1293   ;2199   1292:   Q_Q-K[.1]
U 1293, 0019,2000,05C0,0800,0000,1294   ;2200   1293:   Q_Q-K[.1]
U 1294, 0019,2000,05C0,0800,0000,1295   ;2201   1294:   Q_Q-K[.1]
U 1295, 0019,2000,05C0,0800,0000,1296   ;2202   1295:   Q_Q-K[.1]
U 1296, 0019,2000,05C0,0800,0000,1297   ;2203   1296:   Q_Q-K[.1]
U 1297, 0019,2000,05C0,0800,0000,1298   ;2204   1297:   Q_Q-K[.1]
U 1298, 0019,2000,05C0,0800,0000,1299   ;2205   1298:   Q_Q-K[.1]
U 1299, 0019,2000,05C0,0800,0000,129A   ;2206   1299:   Q_Q-K[.1]
U 129A, 0019,2000,05C0,0800,0000,129B   ;2207   129A:   Q_Q-K[.1]
U 129B, 0019,2000,05C0,0800,0000,129C   ;2208   129B:   Q_Q-K[.1]
U 129C, 0019,2000,05C0,0800,0000,129D   ;2209   129C:   Q_Q-K[.1]
U 129D, 0019,2000,05C0,0800,0000,129E   ;2210   129D:   Q_Q-K[.1]
U 129E, 0019,2000,05C0,0800,0000,129F   ;2211   129E:   Q_Q-K[.1]
U 129F, 0019,2000,05C0,0800,0000,12A0   ;2212   129F:   Q_Q-K[.1]
U 12A0, 0019,2000,05C0,0800,0000,12A1   ;2213   12A0:   Q_Q-K[.1]
U 12A1, 0019,2000,05C0,0800,0000,12A2   ;2214   12A1:   Q_Q-K[.1]
U 12A2, 0019,2000,05C0,0800,0000,12A3   ;2215   12A2:   Q_Q-K[.1]
U 12A3, 0019,2000,05C0,0800,0000,12A4   ;2216   12A3:   Q_Q-K[.1]
U 12A4, 0019,2000,05C0,0800,0000,12A5   ;2217   12A4:   Q_Q-K[.1]
U 12A5, 0019,2000,05C0,0800,0000,12A6   ;2218   12A5:   Q_Q-K[.1]
U 12A6, 0019,2000,05C0,0800,0000,12A7   ;2219   12A6:   Q_Q-K[.1]
U 12A7, 0019,2000,05C0,0800,0000,12A8   ;2220   12A7:   Q_Q-K[.1]
U 12A8, 0019,2000,05C0,0800,0000,12A9   ;2221   12A8:   Q_Q-K[.1]
U 12A9, 0019,2000,05C0,0800,0000,12AA   ;2222   12A9:   Q_Q-K[.1]
U 12AA, 0019,2000,05C0,0800,0000,12AB   ;2223   12AA:   Q_Q-K[.1]
U 12AB, 0019,2000,05C0,0800,0000,12AC   ;2224   12AB:   Q_Q-K[.1]
U 12AC, 0019,2000,05C0,0800,0000,12AD   ;2225   12AC:   Q_Q-K[.1]
U 12AD, 0019,2000,05C0,0800,0000,12AE   ;2226   12AD:   Q_Q-K[.1]
U 12AE, 0019,2000,05C0,0800,0000,12AF   ;2227   12AE:   Q_Q-K[.1]
U 12AF, 0019,2000,05C0,0800,0000,12B0   ;2228   12AF:   Q_Q-K[.1]
U 12B0, 0019,2000,05C0,0800,0000,12B1   ;2229   12B0:   Q_Q-K[.1]
U 12B1, 0019,2000,05C0,0800,0000,12B2   ;2230   12B1:   Q_Q-K[.1]
U 12B2, 0019,2000,05C0,0800,0000,12B3   ;2231   12B2:   Q_Q-K[.1]
U 12B3, 0019,2000,05C0,0800,0000,12B4   ;2232   12B3:   Q_Q-K[.1]
U 12B4, 0019,2000,05C0,0800,0000,12B5   ;2233   12B4:   Q_Q-K[.1]
U 12B5, 0019,2000,05C0,0800,0000,12B6   ;2234   12B5:   Q_Q-K[.1]
U 12B6, 0019,2000,05C0,0800,0000,12B7   ;2235   12B6:   Q_Q-K[.1]
U 12B7, 0019,2000,05C0,0800,0000,12B8   ;2236   12B7:   Q_Q-K[.1]
U 12B8, 0019,2000,05C0,0800,0000,12B9   ;2237   12B8:   Q_Q-K[.1]
U 12B9, 0019,2000,05C0,0800,0000,12BA   ;2238   12B9:   Q_Q-K[.1]
U 12BA, 0019,2000,05C0,0800,0000,12BB   ;2239   12BA:   Q_Q-K[.1]
U 12BB, 0019,2000,05C0,0800,0000,12BC   ;2240   12BB:   Q_Q-K[.1]
U 12BC, 0019,2000,05C0,0800,0000,12BD   ;2241   12BC:   Q_Q-K[.1]
U 12BD, 0019,2000,05C0,0800,0000,12BE   ;2242   12BD:   Q_Q-K[.1]
U 12BE, 0019,2000,05C0,0800,0000,12BF   ;2243   12BE:   Q_Q-K[.1]
U 12BF, 0019,2000,05C0,0800,0000,12C0   ;2244   12BF:   Q_Q-K[.1]
U 12C0, 0019,2000,05C0,0800,0000,12C1   ;2245   12C0:   Q_Q-K[.1]
```

```
U 12C1, 0019,2000,05C0,0800,0000,12C2    ;2246    12C1:    Q_Q-K[.1]
U 12C2, 0019,2000,05C0,0800,0000,12C3    ;2247    12C2:    Q_Q-K[.1]
U 12C3, 0019,2000,05C0,0800,0000,12C4    ;2248    12C3:    Q_Q-K[.1]
U 12C4, 0019,2000,05C0,0800,0000,12C5    ;2249    12C4:    Q_Q-K[.1]
U 12C5, 0019,2000,05C0,0800,0000,12C6    ;2250    12C5:    Q_Q-K[.1]
U 12C6, 0019,2000,05C0,0800,0000,12C7    ;2251    12C6:    Q_Q-K[.1]
U 12C7, 0019,2000,05C0,0800,0000,12C8    ;2252    12C7:    Q_Q-K[.1]
U 12C8, 0019,2000,05C0,0800,0000,12C9    ;2253    12C8:    Q_Q-K[.1]
U 12C9, 0019,2000,05C0,0800,0000,12CA    ;2254    12C9:    Q_Q-K[.1]
U 12CA, 0019,2000,05C0,0800,0000,12CB    ;2255    12CA:    Q_Q-K[.1]
U 12CB, 0019,2000,05C0,0800,0000,12CC    ;2256    12CB:    Q_Q-K[.1]
U 12CC, 0019,2000,05C0,0800,0000,12CD    ;2257    12CC:    Q_Q-K[.1]
U 12CD, 0019,2000,05C0,0800,0000,12CE    ;2258    12CD:    Q_Q-K[.1]
U 12CE, 0019,2000,05C0,0800,0000,12CF    ;2259    12CE:    Q_Q-K[.1]
U 12CF, 0019,2000,05C0,0800,0000,12D0    ;2260    12CF:    Q_Q-K[.1]
U 12D0, 0019,2000,05C0,0800,0000,12D1    ;2261    12D0:    Q_Q-K[.1]
U 12D1, 0019,2000,05C0,0800,0000,12D2    ;2262    12D1:    Q_Q-K[.1]
U 12D2, 0019,2000,05C0,0800,0000,12D3    ;2263    12D2:    Q_Q-K[.1]
U 12D3, 0019,2000,05C0,0800,0000,12D4    ;2264    12D3:    Q_Q-K[.1]
U 12D4, 0019,2000,05C0,0800,0000,12D5    ;2265    12D4:    Q_Q-K[.1]
U 12D5, 0019,2000,05C0,0800,0000,12D6    ;2266    12D5:    Q_Q-K[.1]
U 12D6, 0019,2000,05C0,0800,0000,12D7    ;2267    12D6:    Q_Q-K[.1]
U 12D7, 0019,2000,05C0,0800,0000,12D8    ;2268    12D7:    Q_Q-K[.1]
U 12D8, 0019,2000,05C0,0800,0000,12D9    ;2269    12D8:    Q_Q-K[.1]
U 12D9, 0019,2000,05C0,0800,0000,12DA    ;2270    12D9:    Q_Q-K[.1]
U 12DA, 0019,2000,05C0,0800,0000,12DB    ;2271    12DA:    Q_Q-K[.1]
U 12DB, 0019,2000,05C0,0800,0000,12DC    ;2272    12DB:    Q_Q-K[.1]
U 12DC, 0019,2000,05C0,0800,0000,12DD    ;2273    12DC:    Q_Q-K[.1]
U 12DD, 0019,2000,05C0,0800,0000,12DE    ;2274    12DD:    Q_Q-K[.1]
U 12DE, 0019,2000,05C0,0800,0000,12DF    ;2275    12DE:    Q_Q-K[.1]
U 12DF, 0019,2000,05C0,0800,0000,12E0    ;2276    12DF:    Q_Q-K[.1]
U 12E0, 0019,2000,05C0,0800,0000,12E1    ;2277    12E0:    Q_Q-K[.1]
U 12E1, 0019,2000,05C0,0800,0000,12E2    ;2278    12E1:    Q_Q-K[.1]
U 12E2, 0019,2000,05C0,0800,0000,12E3    ;2279    12E2:    Q_Q-K[.1]
U 12E3, 0019,2000,05C0,0800,0000,12E4    ;2280    12E3:    Q_Q-K[.1]
U 12E4, 0019,2000,05C0,0800,0000,12E5    ;2281    12E4:    Q_Q-K[.1]
U 12E5, 0019,2000,05C0,0800,0000,12E6    ;2282    12E5:    Q_Q-K[.1]
U 12E6, 0019,2000,05C0,0800,0000,12E7    ;2283    12E6:    Q_Q-K[.1]
U 12E7, 0019,2000,05C0,0800,0000,12E8    ;2284    12E7:    Q_Q-K[.1]
U 12E8, 0019,2000,05C0,0800,0000,12E9    ;2285    12E8:    Q_Q-K[.1]
U 12E9, 0019,2000,05C0,0800,0000,12EA    ;2286    12E9:    Q_Q-K[.1]
U 12EA, 0019,2000,05C0,0800,0000,12EB    ;2287    12EA:    Q_Q-K[.1]
U 12EB, 0019,2000,05C0,0800,0000,12EC    ;2288    12EB:    Q_Q-K[.1]
U 12EC, 0019,2000,05C0,0800,0000,12ED    ;2289    12EC:    Q_Q-K[.1]
U 12ED, 0019,2000,05C0,0800,0000,12EE    ;2290    12ED:    Q_Q-K[.1]
U 12EE, 0019,2000,05C0,0800,0000,12EF    ;2291    12EE:    Q_Q-K[.1]
U 12EF, 0019,2000,05C0,0800,0000,12F0    ;2292    12EF:    Q_Q-K[.1]
U 12F0, 0019,2000,05C0,0800,0000,12F1    ;2293    12F0:    Q_Q-K[.1]
U 12F1, 0019,2000,05C0,0800,0000,12F2    ;2294    12F1:    Q_Q-K[.1]
U 12F2, 0019,2000,05C0,0800,0000,12F3    ;2295    12F2:    Q_Q-K[.1]
U 12F3, 0019,2000,05C0,0800,0000,12F4    ;2296    12F3:    Q_Q-K[.1]
U 12F4, 0019,2000,05C0,0800,0000,12F5    ;2297    12F4:    Q_Q-K[.1]
U 12F5, 0019,2000,05C0,0800,0000,12F6    ;2298    12F5:    Q_Q-K[.1]
U 12F6, 0019,2000,05C0,0800,0000,12F7    ;2299    12F6:    Q_Q-K[.1]
U 12F7, 0019,2000,05C0,0800,0000,12F8    ;2300    12F7:    Q_Q-K[.1]
```

```
U 12F8, 0019,2000,05C0,0800,0000,12F9     12F8:   Q_Q-K[.1]
U 12F9, 0019,2000,05C0,0800,0000,12FA     12F9:   Q_Q-K[.1]
U 12FA, 0019,2000,05C0,0800,0000,12FB     12FA:   Q_Q-K[.1]
U 12FB, 0019,2000,05C0,0800,0000,12FC     12FB:   Q_Q-K[.1]
U 12FC, 0019,2000,05C0,0800,0000,12FD     12FC:   Q_Q-K[.1]
U 12FD, 0019,2000,05C0,0800,0000,12FE     12FD:   Q_Q-K[.1]
U 12FE, 0019,2000,05C0,0800,0000,12FF     12FE:   Q_Q-K[.1]
U 12FF, 0019,2002,05C0,0800,0000,0001     12FF:   Q_Q-K[.1],RETURN1

                                          ;+
                                          ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE CACHE
                                          ; REFERANCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB IS
                                          ; COMPLETELY FULL OF DATA.
                                          ;-

U 1364, 3000,003C,0180,6000,0000,1365     IBWAIT: LOAD.IB,IBC/START
U 1365, 0000,003C,0180,F800,0000,1366     SYNC02: MCT/ALLOW.IB.READ
U 1366, 0000,003C,0180,F800,0000,1367             MCT/ALLOW.IB.READ
                                          SYNC21:
U 1367, 0000,003C,0180,F800,0000,1368     WAIT2:  MCT/ALLOW.IB.READ
U 1368, 0000,003C,0180,F800,0000,1369             MCT/ALLOW.IB.READ
                                          SYNC20:
U 1369, 0000,003C,0180,F800,0000,136A     WAIT1:  MCT/ALLOW.IB.READ
U 136A, 1000,003E,0180,F800,0000,0001             MCT/ALLOW.IB.READ,IBC/STOP,RETURN1

                                          ;+
                                          ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER, WAITS FOR ONE REFERANCE,
                                          ; AND SHUTS THE IB OFF.
                                          ;-

                                          IBWAITONCE:
U 136B, 3000,003C,0180,6000,0000,1369             LOAD.IB,IBC/START,J/WAIT1


                                          ;+
                                          ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER, WAITS FOR TWO REFERANCES,
                                          ; AND SHUTS THE IB OFF.
                                          ;-

                                          IBTWICE:
U 136C, 3000,003C,0180,6000,0000,1367             LOAD.IB,IBC/START,J/WAIT2
```

```
.PAGE   "TEST 118       SHIFT MULTIPLEXOR DATA INTEGRITY"
;*********************************************************************
;++
; TEST  118     SHIFT MULTIPLEXOR DATA INTEGRITY
;
; TEST DESCRIPTION
;       THIS TEST CHECKS THE DATA INTEGRITY OF THE BYTE SHIFTERS. THIS IS
;       DONE BY TAKING AN 8 BYTE MEMORY PATTERN OF ALL ONES, WRITING A
;       BYTE OF ALL ZEROS INTO THIS PATTERN IN THE POSITION THAT WILL GET
;       SHIFTED INTO THE BYTE UNDER TEST, ALLOWING THE IB TO LOAD THE
;       PATTERN, EXECUTING THE SHIFT, AND THEN CHECKING THE BYTE UNDER
;       TEST TO ENSURE THE ZEROS WERE SHIFTED INTO IT.
;       THE TEST IS THEN REPEATED WITH THE COMPLIMENT PATTERN.
;
;       SUBTST 1 - BYTE 0 GETS BYTE 1
;       SUBTST 2 - BYTE 0 GETS BYTE 2
;       SUBTST 3 - BYTE 0 GETS BYTE 4
;       SUBTST 4 - BYTE 1 GETS BYTE 1
;       SUBTST 5 - BYTE 1 GETS BYTE 2
;       SUBTST 6 - BYTE 1 GETS BYTE 3
;       SUBTST 7 - BYTE 1 GETS BYTE 5
;       SUBTST 8 - BYTE 2 GETS BYTE 2
;       SUBTST 9 - BYTE 2 GETS BYTE 3
;       SUBTST A - BYTE 2 GETS BYTE 4
;       SUBTST B - BYTE 2 GETS BYTE 6
;       SUBTST C - BYTE 3 GETS BYTE 3
;       SUBTST D - BYTE 3 GETS BYTE 4
;       SUBTST E - BYTE 3 GETS BYTE 5
;       SUBTST F - BYTE 3 GETS BYTE 7
;       SUBTST 10- BYTE 4 GETS BYTE 4
;       SUBTST 11- BYTE 4 GETS BYTE 5
;       SUBTST 12- BYTE 4 GETS BYTE 6
;       SUBTST 13- BYTE 4 GETS INVALIDATED
;       SUBTST 41- BYTE 5 GETS BYTE 5
;       SUBTST 15- BYTE 5 GETS BYTE 6
;       SUBTST 16- BYTE 5 GETS BYTE 7
;       SUBTST 17- BYTE 5 GETS INVALIDATED
;       SUBTST 18- BYTE 6 GETS BYTE 6
;       SUBTST 19- BYTE 6 GETS BYTE 7
;       SUBTST 1A- BYTE 6 GETS INVALIDATED
;
; LOGIC DESCRIPTION
;       THIS TEST CHECKS THE DATA PATH BETWEEN THE BUFFER,
;       THE SHIFTER, THE INPUT MULTIPLEXOR, AND BACK TO THE BUFFER ON THE
;       IDP MODULE.
;
; ERROR DESCRIPTION
;       DATA: EXPECTED MICRO PC BITS <7:0>
;             RECEIVED MICRO PC BITS <7:0>
;       THE EXPECTED DATA WILL EITHER BE 8F, 83, OR 7E DEPENDING ON WHETHER
;       THE BYTE UNDER TEST IS ALL ZERO'S OR ALL ONE'S OR INVALID. IF A BIT IS DROPP
;       OR PICKED UP IN THE BYTE UNDER TEST, THE RECEIVED DATA COULD BE
;       ANYTHING.
;
; SYNC POINT DESCRIPTION
```

```
                                          ;2397   :       SUBTST 1 - SYNC06--BYTE 0 GETS BYTE 1
                                          ;2398   :       SUBTST 2 - SYNC07--BYTE 0 GETS BYTE 2
                                          ;2399   :       SUBTST 3 - SYNC08--BYTE 0 GETS BYTE 4
                                          ;2400   :       SUBTST 4 - SYNC09--BYTE 1 GETS BYTE 1
                                          ;2401   :       SUBTST 5 - SYNC0A--BYTE 1 GETS BYTE 2
                                          ;2402   :       SUBTST 6 - SYNC0B--BYTE 1 GETS BYTE 3
                                          ;2403   :       SUBTST 7 - SYNC0C--BYTE 1 GETS BYTE 5
                                          ;2404   :       SUBTST 8 - SYNC0D--BYTE 2 GETS BYTE 2
                                          ;2405   :       SUBTST 9 - SYNC0E--BYTE 2 GETS BYTE 3
                                          ;2406   :       SUBTST A - SYNC0F--BYTE 2 GETS BYTE 4
                                          ;2407   :       SUBTST B - SYNC10--BYTE 2 GETS BYTE 6
                                          ;2408   :       SUBTST C - SYNC11--BYTE 3 GETS BYTE 3
                                          ;2409   :       SUBTST D - SYNC12--BYTE 3 GETS BYTE 4
                                          ;2410   :       SUBTST E - SYNC13--BYTE 3 GETS BYTE 5
                                          ;2411   :       SUBTST F - SYNC14--BYTE 3 GETS BYTE 7
                                          ;2412   :       SUBTST 10- SYNC15--BYTE 4 GETS BYTE 4
                                          ;2413   :       SUBTST 11- SYNC16--BYTE 4 GETS BYTE 5
                                          ;2414   :       SUBTST 12- SYNC17--BYTE 4 GETS BYTE 6
                                          ;2415   :       SUBTST 13- SYNC18--BYTE 4 GETS INVALIDATED
                                          ;2416   :       SUBTST 14- SYNC19--BYTE 5 GETS BYTE 5
                                          ;2417   :       SUBTST 15- SYNC1A--BYTE 5 GETS BYTE 6
                                          ;2418   :       SUBTST 16- SYNC1B--BYTE 5 GETS BYTE 7
                                          ;2419   :       SUBTST 17- SYNC1C--BYTE 5 GETS INVALIDATED
                                          ;2420   :       SUBTST 18- SYNC1D--BYTE 6 GETS BYTE 6
                                          ;2421   :       SUBTST 19- SYNC1E--BYTE 6 GETS BYTE 7
                                          ;2422   :       SUBTST 1A- SYNC1F--BYTE 6 GETS INVALIDATED
                                          ;2423   :--
                                          ;2424   ;*********************************************************************
                                          ;2425   =0
U 100A, 0018,0039,0980,09F8,0000,105F     ;2426   T118:   NEWTST[.2]
U 100B, 0018,0038,6580,0A88,0000,136D     ;2427           R[1]_K[.10]                     ; SET ADDRESS OF IB DATA (+16)
U 136D, 0018,0038,0580,0A80,0000,100C     ;2428           R[0]_K[.1]                      ; SET ADDRESS OF BYTE UNDER TEST
U 100C, 0818,0039,0180,0800,0000,133D     ;2429   =0      D_K[.8],CALL,J/DC3              ; GEN EXP ADR WHEN BYTE 0=FF
U 100D, 0001,003C,0180,0A90,0000,1010     ;2430           R[2]_D                          ; SAVE IN R2
U 1010, 0818,0039,0180,0800,0000,1349     ;2431   =0      D_K[.8],CALL,J/DCF              ; GEN ADDRESS WHEN BYTE 0 = 00
U 1011, 0001,003C,0180,0A98,0082,1012     ;2432           R[3]_D,SC_ALU                   ; SAVE IN R3
                                          ;2433
                                          ;2434   ;////////////////////////////////////////////////////////////////////////
                                          ;2435   ;+
                                          ;2436   ; BYTE 0---SHIFT BY ONE
                                          ;2437   ;-
                                          ;2438
                                          ;2439   =0
U 1012, 0000,003D,0180,0800,0000,134F     ;2440   T118S1: SUBTEST
U 1013, 0018,0038,0980,0AA0,0000,1014     ;2441           R[4]_K[.2]                      ; SET THE LOOP CNT
U 1014, 0000,003D,6580,0A08,0000,1354     ;2442   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1015, 0000,003C,0180,AA18,0000,1018     ;2443           CACHE.P_D[LONG],LAB_R[3]
                                          ;2444   =0
U 1018, 0000,003D,0180,09F0,0000,1335     ;2445   T118L1: ERLOOP,RC[0E]_LA                ; SAVE EXPECTED ADDRESS
U 1019, 1810,0038,0180,0970,0000,101A     ;2446           D_RC[0E],IBC/STOP               ; PUT IT IN D REG
U 101A, 2000,003D,0180,0A08,4200,1364     ;2447   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 101B, 0000,003C,0180,0800,0000,101C     ;2448           NOP
                                          ;2449   =0
U 101C, C000,003D,0180,0800,0000,1363     ;2450   SYNC06: IBC/CLR.0,CALL,J/DISPAT         ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 101D, 001D,A000,0180,0800,0010,136E     ;2451           ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
```

```
U 136E, 0000,013C,0180,0A00,0200,1020    ;2452              Z?,VA_R[0]                       ; BRANCH IF YES
U 1020, 0001,A03D,0180,09E8,0000,1336    ;2453      =0      ERRORT,RC[0D]_Q,BYTE             ;
U 1021, 0000,003C,0180,0800,0000,1022    ;2454              NOP
U 1022, 0000,003D,0180,0A08,0000,135A    ;2455      =0      LAB_R[1],CALL,J/SETUPFF          ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1023, 0018,0000,0580,0AA0,0010,136F    ;2456              R[4]_LA-K[.1],CLK.UBCC           ; CHECK THE LOOP COUNT
U 136F, 0000,013C,0180,0800,0000,1024    ;2457              Z?                               ; BRANCH IF LOOP FINISHED
U 1024, 0000,003C,0180,0A10,0000,1018    ;2458      =0      LAB_R[2],J/T118L1                ; CONTINUE TESTING
                                         ;2459
                                         ;2460
                                         ;2461      ;//////////////////////////////////////////////////////////////////////
                                         ;2462      ;+
                                         ;2463      ; BYTE 0---TWO SHIFT
                                         ;2464      ;-
                                         ;2465
U 1025, 0018,0038,0980,0AA0,0000,1028    ;2466      T118S2: R[4]_K[.2]                       ; SET THE LOOP COUNT
U 1028, 0000,003D,0180,0800,0000,134F    ;2467      =0      SUBTEST
U 1029, 0000,003C,0180,0A00,0000,1370    ;2468              LAB_R[0]
U 1370, 0018,0014,0580,0A80,0000,102A    ;2469              R[0]_LA+K[.1]                    ; SET NEW BYTE ADDRESS
U 102A, 0000,003D,6580,0A08,0000,1354    ;2470      =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 102B, 0000,003C,0180,AA18,0000,102C    ;2471              CACHE.P_D[LONG],LAB_R[3]
                                         ;2472
                                         ;2473      =0
U 102C, 0000,003D,0180,09F0,0000,1335    ;2474      T118L2: ERLOOP,RC[0E]_LA                 ; SAVE EXPECTED ADDRESS
U 102D, 0810,0038,0180,0970,0000,1030    ;2475              D_RC[0E]                         ; PUT IT IN D REG
U 1030, 2000,003D,0180,0A08,4200,1364    ;2476      =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE IB
U 1031, 0000,003C,0180,0800,0000,1032    ;2477              NOP
                                         ;2478      =0
U 1032, 4000,003D,0180,0800,0000,1363    ;2479      SYNC07: IBC/CLR.0.1,CALL,J/DISPAT        ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 1033, 001D,A000,0180,0800,0010,1371    ;2480              ALU_Q-D,CLK.UBCC,BYTE            ; DATA OK?
U 1371, 0000,013C,0180,0A00,0200,1034    ;2481              Z?,VA_R[0]                       ; BRANCH IF YES
U 1034, 0001,A03D,0180,09E8,0000,1336    ;2482      =0      ERRORT,RC[0D]_Q,BYTE             ;
U 1035, 0000,003C,0180,0800,0000,1038    ;2483              NOP
U 1038, 0000,003D,0180,0A08,0000,135A    ;2484      =0      LAB_R[1],CALL,J/SETUPFF          ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1039, 0018,0000,0580,0AA0,0010,1372    ;2485              R[4]_LA-K[.1],CLK.UBCC           ; CHECK THE LOOP COUNT
U 1372, 0000,013C,0180,0800,0000,103A    ;2486              Z?                               ; BRANCH IF LOOP FINISHED
U 103A, 0000,003C,0180,0A10,0000,102C    ;2487      =0      LAB_R[2],J/T118L2                ; CONTINUE TESTING
                                         ;2488
                                         ;2489
                                         ;2490      ;//////////////////////////////////////////////////////////////////////
                                         ;2491      ;+
                                         ;2492      ; BYTE 0---FOUR SHIFT
                                         ;2493      ;-
                                         ;2494
U 103B, 0018,0038,0980,0AA0,0000,103C    ;2495      T118S3: R[4]_K[.2]                       ; SET THE LOOP COUNT
U 103C, 0000,003D,0180,0800,0000,134F    ;2496      =0      SUBTEST
U 103D, 0000,003C,0180,0A00,0000,1373    ;2497              LAB_R[0]
U 1373, 0018,0014,0980,0A80,0000,1040    ;2498              R[0]_LA+K[.2]                    ; SET ADR OF NEW BYTE
U 1040, 0000,003D,6580,0A08,0000,1354    ;2499      =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1041, 0000,003C,0180,AA18,0000,1042    ;2500              CACHE.P_D[LONG],LAB_R[3]
                                         ;2501
                                         ;2502      =0
U 1042, 0000,003D,0180,09F0,0000,1335    ;2503      T118L3: ERLOOP,RC[0E]_LA                 ; SAVE EXPECTED ADDRESS
U 1043, 0810,0038,0180,0970,0000,1044    ;2504              D_RC[0E]                         ; PUT IT IN D REG
U 1044, 2000,003D,0180,0A08,4200,1364    ;2505      =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE IB
U 1045, 0000,003C,0180,0800,0000,1046    ;2506              NOP
```

```
                                      ;2507   =0
U 1046, E000,003D,0180,0800,0000,1363 ;2508   SYNC08: IBC/CLR.0-3,CALL,J/DISPAT       ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 1047, 001D,A000,0180,0800,0010,1374 ;2509           ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 1374, 0000,013C,0180,0A00,0200,1048 ;2510           Z?,VA_R[0]                      ; BRANCH IF YES
U 1048, 0001,A03D,0180,09E8,0000,1336 ;2511   =0      ERRORT,RC[0D]_Q,BYTE            ;
U 1049, 0000,003C,0180,0800,0000,104A ;2512           NOP
U 104A, 0000,003D,0180,0A08,0000,135A ;2513   =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 104B, 0018,0000,0580,0AA0,0010,1375 ;2514           R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 1375, 0000,013C,0180,0800,0000,104C ;2515           Z?                              ; BRANCH IF LOOP FINISHED
U 104C, 0000,003C,0180,0A10,0000,1042 ;2516   =0      LAB_R[2],J/T118L3               ; CONTINUE TESTING
                                      ;2517
                                      ;2518
                                      ;2519   ;////////////////////////////////////////////////////////////////////////
                                      ;2520   ;+
                                      ;2521   ; BYTE 1---NO SHIFT
                                      ;2522   ;-
                                      ;2523
U 104D, 0018,0038,0980,0AA0,0000,1050 ;2524   T118S4: R[4]_K[.2]                      ; SET THE LOOP CNT
U 1050, 0000,003D,0180,0800,0000,134F ;2525   =0      SUBTEST
U 1051, 0018,0038,0580,0A80,0000,1052 ;2526           R[0]_K[.1]                      ; SET NEW BYTE ADDRESS
U 1052, 0000,003D,6580,0A08,0000,1354 ;2527   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1053, 0000,003C,0180,AA18,0000,1054 ;2528           CACHE.P_D[LONG],LAB_R[3]
                                      ;2529
                                      ;2530   =0
U 1054, 0000,003D,0180,09F0,0000,1335 ;2531   T118L4: ERLOOP,RC[0E]_LA                ; SAVE EXPECTED ADDRESS
U 1055, 0810,0038,0180,0970,0000,1056 ;2532           D_RC[0E]                        ; PUT IT IN D REG
U 1056, 2000,003D,0180,0A08,4200,1364 ;2533   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1057, 0000,003C,0180,0800,0000,1058 ;2534   SYNC09: NOP
U 1058, C000,003D,0180,0800,0000,1363 ;2535   =0      IBC/CLR.0,CALL,J/DISPAT         ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 1059, 001D,A000,0180,0800,0010,1376 ;2536           ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 1376, 0000,013C,0180,0A00,0200,105C ;2537           Z?,VA_R[0]                      ; BRANCH IF YES
U 105C, 0001,A03D,0180,09E8,0000,1336 ;2538   =0      ERRORT,RC[0D]_Q,BYTE            ;
U 105D, 0000,003C,0180,0800,0000,1060 ;2539           NOP
U 1060, 0000,003D,0180,0A08,0000,135A ;2540   =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1061, 0018,0000,0580,0AA0,0010,1377 ;2541           R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 1377, 0000,013C,0180,0800,0000,1062 ;2542           Z?                              ; BRANCH IF LOOP FINISHED
U 1062, 0000,003C,0180,0A10,0000,1054 ;2543   =0      LAB_R[2],J/T118L4               ; CONTINUE TESTING
                                      ;2544
                                      ;2545
                                      ;2546   ;////////////////////////////////////////////////////////////////////////
                                      ;2547   ;+
                                      ;2548   ; BYTE 1---ONE SHIFT
                                      ;2549   ;-
                                      ;2550
U 1063, 0018,0038,0980,0AA0,0000,1064 ;2551   T118S5: R[4]_K[.2]                      ; SET THE LOOP COUNT
U 1064, 0000,003D,0180,0800,0000,134F ;2552   =0      SUBTEST
U 1065, 0000,003C,0180,0A00,0000,1378 ;2553           LAB_R[0]
U 1378, 0018,0014,0580,0A80,0000,1066 ;2554           R[0]_LA+K[.1]                   ; SET NEW BYTE ADDRESS
U 1066, 0000,003D,6580,0A08,0000,1354 ;2555   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1067, 0000,003C,0180,AA18,0000,1068 ;2556           CACHE.P_D[LONG],LAB_R[3]
                                      ;2557
                                      ;2558   =0
U 1068, 0000,003D,0180,09F0,0000,1335 ;2559   T118L5: ERLOOP,RC[0E]_LA                ; SAVE EXPECTED ADDRESS
U 1069, 0810,0038,0180,0970,0000,106A ;2560           D_RC[0E]                        ; PUT IT IN D REG
U 106A, 2000,003D,0180,0A08,4200,1364 ;2561   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
```

```
U 106B, D000,003C,0180,0800,0000,106C   ;2562   SYNC0A: IBC/CLR.1
U 106C, C000,003D,0180,0800,0000,1363   ;2563   =0      IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 106D, 001D,A000,0180,0800,0010,1379   ;2564           ALU_Q-D,CLK.UBCC,BYTE            ; DATA OK?
U 1379, 0000,013C,0180,0A00,0200,106E   ;2565           Z?,VA_R[0]                       ; BRANCH IF YES
U 106E, 0001,A03D,0180,09E8,0000,1336   ;2566   =0      ERRORT,RC[0D]_Q,BYTE             ;
U 106F, 0000,003C,0180,0800,0000,1070   ;2567           NOP
U 1070, 0000,003D,0180,0A08,0000,135A   ;2568   =0      LAB_R[1],CALL,J/SETUPFF          ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1071, 0018,0000,0580,0AA0,0010,137A   ;2569           R[4]_LA-K[.1],CLK.UBCC           ; CHECK THE LOOP COUNT
U 137A, 0000,013C,0180,0800,0000,1072   ;2570           Z?                               ; BRANCH IF LOOP FINISHED
U 1072, 0000,003C,0180,0A10,0000,1068   ;2571   =0      LAB_R[2],J/T118L5                ; CONTINUE TESTING
                                        ;2572
                                        ;2573
                                        ;2574   ;//////////////////////////////////////////////////////////////////////
                                        ;2575   ;+
                                        ;2576   ; BYTE 1---TWO SHIFT
                                        ;2577   ;-
                                        ;2578
U 1073, 0018,0038,0980,0AA0,0000,1074   ;2579   T118S6: R[4]_K[.2]                       ; SET THE LOOP COUNT
U 1074, 0000,003D,0180,0800,0000,134F   ;2580   =0      SUBTEST
U 1075, 0000,003C,0180,0A00,0000,137B   ;2581           LAB_R[0]
U 137B, 0018,0014,0580,0A80,0000,1076   ;2582           R[0]_LA+K[.1]                    ; SET NEW BYTE ADDRESS
U 1076, 0000,003D,6580,0A08,0000,1354   ;2583   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1077, 0000,003C,0180,AA18,0000,1078   ;2584           CACHE.P_D[LONG],LAB_R[3]
                                        ;2585
                                        ;2586   =0
U 1078, 0000,003D,0180,09F0,0000,1335   ;2587   T118L6: ERLOOP,RC[0E]_LA                 ; SAVE EXPECTED ADDRESS
U 1079, 0810,0038,0180,0970,0000,107A   ;2588           D_RC[0E]                         ; PUT IT IN D REG
U 107A, 2000,003D,0180,0A08,4200,1364   ;2589   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 107B, 4000,003C,0180,0800,0000,107C   ;2590   SYNC0B: IBC7CLR.0.1
U 107C, C000,003D,0180,0800,0000,1363   ;2591   =0      IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 107D, 001D,A000,0180,0800,0010,137C   ;2592           ALU_Q-D,CLK.UBCC,BYTE            ; DATA OK?
U 137C, 0000,013C,0180,0A00,0200,107E   ;2593           Z?,VA_R[0]                       ; BRANCH IF YES
U 107E, 0001,A03D,0180,09E8,0000,1336   ;2594   =0      ERRORT,RC[0D]_Q,BYTE             ;
U 107F, 0000,003C,0180,0800,0000,1080   ;2595           NOP
U 1080, 0000,003D,0180,0A08,0000,135A   ;2596   =0      LAB_R[1],CALL,J/SETUPFF          ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1081, 0018,0000,0580,0AA0,0010,137D   ;2597           R[4]_LA-K[.1],CLK.UBCC           ; CHECK THE LOOP COUNT
U 137D, 0000,013C,0180,0800,0000,1082   ;2598           Z?                               ; BRANCH IF LOOP FINISHED
U 1082, 0000,003C,0180,0A10,0000,1078   ;2599   =0      LAB_R[2],J/T118L6                ; CONTINUE TESTING
                                        ;2600
                                        ;2601
                                        ;2602   ;//////////////////////////////////////////////////////////////////////
                                        ;2603   ;+
                                        ;2604   ; BYTE 1---FOUR SHIFT
                                        ;2605   ;-
                                        ;2606
U 1083, 0018,0038,0980,0AA0,0000,1084   ;2607   T118S7: R[4]_K[.2]                       ; SET THE LOOP COUNT
U 1084, 0000,003D,0180,0800,0000,134F   ;2608   =0      SUBTEST
U 1085, 0000,003C,0180,0A00,0000,137E   ;2609           LAB_R[0]
U 137E, 0018,0014,0980,0A80,0000,1086   ;2610           R[0]_LA+K[.2]                    ; SET ADR OF NEW BYTE
U 1086, 0000,003D,6580,0A08,0000,1354   ;2611   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1087, 0000,003C,0180,AA18,0000,137F   ;2612           CACHE.P_D[LONG],LAB_R[3]
U 137F, 0000,803C,0180,AA18,0000,1088   ;2613           CACHE.P_D[BYTE],LAB_R[3]         ; WRITE ZERO TO THE BYTE
                                        ;2614
                                        ;2615   =0
U 1088, 0000,003D,0180,09F0,0000,1335   ;2616   T118L7: ERLOOP,RC[0E]_LA                 ; SAVE EXPECTED ADDRESS
```

```
U 1089, 0810,0038,0180,0970,0000,108A    ;2617                D_RC[0E]                          ; PUT IT IN D REG
U 108A, 2000,003D,0180,0A08,4200,1364    ;2618      =0        A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 108B, E000,003C,0180,0800,0000,108C    ;2619      SYNC0C:   IBC7CLR.0-3
U 108C, C000,003D,0180,0800,0000,1363    ;2620      =0        IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 108D, 001D,A000,0180,0800,0010,1380    ;2621                ALU_Q-D,CLK.UBCC,BYTE             ; DATA OK?
U 1380, 0000,013C,0180,0A00,0200,108E    ;2622                Z?,VA_R[0]                        ; BRANCH IF YES
U 108E, 0001,A03D,0180,09E8,0000,1336    ;2623      =0        ERRORT,RC[0D]_Q,BYTE              ;
U 108F, 0000,003C,0180,0800,0000,1090    ;2624                NOP
U 1090, 0000,003D,0180,0A08,0000,135A    ;2625      =0        LAB_R[1],CALL,J/SETUPFF           ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1091, 0018,0000,0580,0AA0,0010,1381    ;2626                R[4]_LA-K[.1],CLK.UBCC            ; CHECK THE LOOP COUNT
U 1381, 0000,013C,0180,0800,0000,1092    ;2627                Z?                                ; BRANCH IF LOOP FINISHED
U 1092, 0000,003C,0180,0A10,0000,1088    ;2628      =0        LAB_R[2],J/T118L7                 ; CONTINUE TESTING
                                         ;2629
                                         ;2630
                                         ;2631      ;//////////////////////////////////////////////////////////////////////
                                         ;2632      ;+
                                         ;2633      ; BYTE 2---NO SHIFT
                                         ;2634      ;-
                                         ;2635
U 1093, 0018,0038,0980,0A80,0000,1094    ;2636      T118S8:   R[0]_K[.2]                        ; SET ADDRESS OF BYTE UNDER TEST
U 1094, 0000,003D,0180,0800,0000,134F    ;2637      =0        SUBTEST
U 1095, 0018,0038,0980,0AA0,0000,1096    ;2638                R[4]_K[.2]                        ; SET THE LOOP COUNT
U 1096, 0000,003D,6580,0A08,0000,1354    ;2639      =0        LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1097, 0000,003C,0180,AA18,0000,1098    ;2640                CACHE.P_D[LONG],LAB_R[3]
                                         ;2641
                                         ;2642      =0
U 1098, 0000,003D,0180,09F0,0000,1335    ;2643      T118L8:   ERLOOP,RC[0E]_LA                  ; SAVE EXPECTED ADDRESS
U 1099, 0810,0038,0180,0970,0000,109A    ;2644                D_RC[0E]                          ; PUT IT IN D REG
U 109A, 2000,003D,0180,0A08,4200,1364    ;2645      =0        A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 109B, 0000,003C,0180,0800,0000,109C    ;2646      SYNC0D:   NOP
U 109C, 4000,003D,0180,0800,0000,1363    ;2647      =0        IBC/CLR.0.1,CALL,J/DISPAT         ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 109D, 001D,A000,0180,0800,0010,1382    ;2648                ALU_Q-D,CLK.UBCC,BYTE             ; DATA OK?
U 1382, 0000,013C,0180,0A00,0200,109E    ;2649                Z?,VA_R[0]                        ; BRANCH IF YES
U 109E, 0001,A03D,0180,09E8,0000,1336    ;2650      =0        ERRORT,RC[0D]_Q,BYTE              ;
U 109F, 0000,003C,0180,0800,0000,10A0    ;2651                NOP
U 10A0, 0000,003D,0180,0A08,0000,135A    ;2652      =0        LAB_R[1],CALL,J/SETUPFF           ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 10A1, 0018,0000,0580,0AA0,0010,1383    ;2653                R[4]_LA-K[.1],CLK.UBCC            ; CHECK THE LOOP COUNT
U 1383, 0000,013C,0180,0800,0000,10A2    ;2654                Z?                                ; BRANCH IF LOOP FINISHED
U 10A2, 0000,003C,0180,0A10,0000,1098    ;2655      =0        LAB_R[2],J/T118L8                 ; CONTINUE TESTING
                                         ;2656
                                         ;2657
                                         ;2658      ;//////////////////////////////////////////////////////////////////////
                                         ;2659      ;+
                                         ;2660      ; BYTE 2---ONE SHIFT
                                         ;2661      ;-
                                         ;2662
U 10A3, 0018,0038,0980,0AA0,0000,10A4    ;2663      T118S9:   R[4]_K[.2]                        ; SET THE LOOP COUNT
U 10A4, 0000,003D,0180,0800,0000,134F    ;2664      =0        SUBTEST
U 10A5, 0000,003C,0180,0A00,0000,1384    ;2665                LAB_R[0]
U 1384, 0018,0014,0580,0A80,0000,10A6    ;2666                R[0]_LA+K[.1]                     ; SET NEW BYTE ADDRESS
U 10A6, 0000,003D,6580,0A08,0000,1354    ;2667      =0        LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 10A7, 0000,003C,0180,AA18,0000,10A8    ;2668                CACHE.P_D[LONG],LAB_R[3]
                                         ;2669
                                         ;2670      =0
U 10A8, 0000,003D,0180,09F0,0000,1335    ;2671      T118L9:   ERLOOP,RC[0E]_LA                  ; SAVE EXPECTED ADDRESS
```

```
U 10A9, 0810,0038,0180,0970,0000,10AA    ;2672              D_RC[0E]                          ; PUT IT IN D REG
U 10AA, 2000,003D,0180,0A08,4200,1364    ;2673      =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10AB, D000,003C,0180,0800,0000,1385    ;2674      SYNC0E: IBC7CLR.1
U 1385, C000,003C,0180,0800,0000,10AC    ;2675              IBC/CLR.0
U 10AC, C000,003D,0180,0800,0000,1363    ;2676      =0      IBC/CLR.0,CALL,J/DISPAT           ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 10AD, 001D,A000,0180,0800,0010,1386    ;2677              ALU_Q-D,CLK.UBCC,BYTE             ; DATA OK?
U 1386, 0000,013C,0180,0A00,0200,10AE    ;2678              Z?,VA_R[0]                        ; BRANCH IF YES
U 10AE, 0001,A03D,0180,09E8,0000,1336    ;2679      =0      ERRORT,RC[0D]_Q,BYTE              ;
U 10AF, 0000,003C,0180,0800,0000,10B0    ;2680              NOP
U 10B0, 0000,003D,0180,0A08,0000,135A    ;2681      =0      LAB_R[1],CALL,J/SETUPFF           ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 10B1, 0018,0000,0580,0AA0,0010,1387    ;2682              R[4]_LA-K[.1],CLK.UBCC            ; CHECK THE LOOP COUNT
U 1387, 0000,013C,0180,0800,0000,10B2    ;2683              Z?                                ; BRANCH IF LOOP FINISHED
U 10B2, 0000,003C,0180,0A10,0000,10A8    ;2684      =0      LAB_R[2],J/T118L9                 ; CONTINUE TESTING
                                         ;2685
                                         ;2686
                                         ;2687      ;//////////////////////////////////////////////////////////////////////
                                         ;2688      ;+
                                         ;2689      ; BYTE 2---TWO SHIFT
                                         ;2690      ;-
                                         ;2691
U 10B3, 0018,0038,0980,0AA0,0000,10B4    ;2692      T118SA: R[4]_K[.2]                        ; SET THE LOOP COUNT
U 10B4, 0000,003D,0180,0800,0000,134F    ;2693      =0      SUBTEST
U 10B5, 0000,003C,0180,0A00,0000,1388    ;2694              LAB_R[0]
U 1388, 0018,0014,0580,0A80,0000,10B6    ;2695              R[0]_LA+K[.1]                     ; SET NEW BYTE ADDRESS
U 10B6, 0000,003D,6580,0A08,0000,1354    ;2696      =0      LAB_R[1],KMX/.10,CALL,J/SETUP00   ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 10B7, 0000,003C,0180,AA18,0000,10B8    ;2697              CACHE.P_D[LONG],LAB_R[3]
                                         ;2698
                                         ;2699      =0
U 10B8, 0000,003D,0180,09F0,0000,1335    ;2700      T118L10:        ERLOOP,RC[0E]_LA                  ; SAVE EXPECTED ADDRESS
U 10B9, 0810,0038,0180,0970,0000,10BA    ;2701              D_RC[0E]                          ; PUT IT IN D REG
U 10BA, 2000,003D,0180,0A08,4200,1364    ;2702      =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10BB, 4000,003C,0180,0800,0000,10BC    ;2703      SYNC0F: IBC7CLR.0.1
U 10BC, 4000,003D,0180,0800,0000,1363    ;2704      =0      IBC/CLR.0.1,CALL,J/DISPAT         ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 10BD, 001D,A000,0180,0800,0010,1389    ;2705              ALU_Q-D,CLK.UBCC,BYTE             ; DATA OK?
U 1389, 0000,013C,0180,0A00,0200,10BE    ;2706              Z?,VA_R[0]                        ; BRANCH IF YES
U 10BE, 0001,A03D,0180,09E8,0000,1336    ;2707      =0      ERRORT,RC[0D]_Q,BYTE              ;
U 10BF, 0000,003C,0180,0800,0000,10C0    ;2708              NOP
U 10C0, 0000,003D,0180,0A08,0000,135A    ;2709      =0      LAB_R[1],CALL,J/SETUPFF           ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 10C1, 0018,0000,0580,0AA0,0010,138A    ;2710              R[4]_LA-K[.1],CLK.UBCC            ; CHECK THE LOOP COUNT
U 138A, 0000,013C,0180,0800,0000,10C2    ;2711              Z?                                ; BRANCH IF LOOP FINISHED
U 10C2, 0000,003C,0180,0A10,0000,10B8    ;2712      =0      LAB_R[2],J/T118L10                ; CONTINUE TESTING
                                         ;2713
                                         ;2714
                                         ;2715      ;//////////////////////////////////////////////////////////////////////
                                         ;2716      ;+
                                         ;2717      ; BYTE 2---FOUR SHIFT
                                         ;2718      ;-
                                         ;2719
U 10C3, 0018,0038,0980,0AA0,0000,10C4    ;2720      T118SB: R[4]_K[.2]                        ; SET THE LOOP COUNT
U 10C4, 0000,003D,0180,0800,0000,134F    ;2721      =0      SUBTEST
U 10C5, 0000,003C,0180,0A00,0000,138B    ;2722              LAB_R[0]
U 138B, 0018,0014,0980,0A80,0000,10C6    ;2723              R[0]_LA+K[.2]                     ; SET ADR OF NEW BYTE
U 10C6, 0000,003D,6580,0A08,0000,1354    ;2724      =0      LAB_R[1],KMX/.10,CALL,J/SETUP00   ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 10C7, 0000,003C,0180,AA18,0000,10C8    ;2725              CACHE.P_D[LONG],LAB_R[3]
                                         ;2726
```

```
                                            ;2727   =0
U 10C8, 0000,003D,0180,09F0,0000,1335       ;2728   T118L11:ERLOOP,RC[0E]_LA               ; SAVE EXPECTED ADDRESS
U 10C9, 0810,0038,0180,0970,0000,10CA       ;2729           D_RC[0E]                       ; PUT IT IN D REG
U 10CA, 2000,003D,0180,0A08,4200,1364       ;2730   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10CB, E000,003C,0180,0800,0000,10CC       ;2731   SYNC10: IBC7CLR.0-3
U 10CC, 4000,003D,0180,0800,0000,1363       ;2732   =0      IBC/CLR.0.1,CALL,J/DISPAT      ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 10CD, 001D,A000,0180,0800,0010,138C       ;2733           ALU_Q-D,CLK.UBCC,BYTE          ; DATA OK?
U 138C, 0000,013C,0180,0A00,0200,10CE       ;2734           Z?,VA_R[0]                     ; BRANCH IF YES
U 10CE, 0001,A03D,0180,09E8,0000,1336       ;2735   =0      ERRORT,RC[0D]_Q,BYTE           ;
U 10CF, 0000,003C,0180,0800,0000,10D0       ;2736           NOP
U 10D0, 0000,003D,0180,0A08,0000,135A       ;2737   =0      LAB_R[1],CALL,J/SETUPFF        ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 10D1, 0018,0000,0580,0[illegible]0,0010,138D       ;2738           R[4]_LA-K[.1],CLK.UBCC         ; CHECK THE LOOP COUNT
U 138D, 0000,013C,0180,[illegible],0000,10D2       ;2739           Z?                             ; BRANCH IF LOOP FINISHED
U 10D2, 0000,003C,0180,0A10,0000,10C8       ;2740   =0      LAB_R[2],J/T118L11             ; CONTINUE TESTING
                                            ;2741
                                            ;2742
                                            ;2743   ;//////////////////////////////////////////////////////////////////////
                                            ;2744   ;+
                                            ;2745   ; BYTE 3---ZERO SHIFT
                                            ;2746   ;-
                                            ;2747
U 10D3, 0018,0038,0D80,0A80,0000,10D4       ;2748   T118SC: R[0]_K[.3]                     ; SET ADR OF BYTE UNDER TEST
U 10D4, 0000,003D,0180,0800,0000,134F       ;2749   =0      SUBTEST
U 10D5, 0018,0038,0980,0AA0,0000,10D6       ;2750           R[4]_K[.2]                     ; SET THE LOOP COUNT
U 10D6, 0000,003D,6580,0A08,0000,1354       ;2751   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 10D7, 0000,003C,0180,AA18,0000,10D8       ;2752           CACHE.P_D[LONG],LAB_R[3]
                                            ;2753
                                            ;2754   =0
U 10D8, 0000,003D,0180,09F0,0000,1335       ;2755   T118L12:ERLOOP,RC[0E]_LA               ; SAVE EXPECTED ADDRESS
U 10D9, 0810,0038,0180,0970,0000,10DA       ;2756           D_RC[0E]                       ; PUT IT IN D REG
U 10DA, 2000,003D,0180,0A08,4200,1364       ;2757   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10DB, 0000,003C,0180,0800,0000,138E       ;2758   SYNC11: NOP
U 138E, 4000,003C,0180,0800,0000,10DC       ;2759           IBC/CLR.0.1
U 10DC, C000,003D,0180,0800,0000,1363       ;2760   =0      IBC/CLR.0,CALL,J/DISPAT        ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 10DD, 001D,A000,0180,0800,0010,138F       ;2761           ALU_Q-D,CLK.UBCC,BYTE          ; DATA OK?
U 138F, 0000,013C,0180,0A00,0200,10DE       ;2762           Z?,VA_R[0]                     ; BRANCH IF YES
U 10DE, 0001,A03D,0180,09E8,0000,1336       ;2763   =0      ERRORT,RC[0D]_Q,BYTE           ;
U 10DF, 0000,003C,0180,0800,0000,10E0       ;2764           NOP
U 10E0, 0000,003D,0180,0A08,0000,135A       ;2765   =0      LAB_R[1],CALL,J/SETUPFF        ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 10E1, 0018,0000,0580,0AA0,0010,1390       ;2766           R[4]_LA-K[.1],CLK.UBCC         ; CHECK THE LOOP COUNT
U 1390, 0000,013C,0180,0800,0000,10E2       ;2767           Z?                             ; BRANCH IF LOOP FINISHED
U 10E2, 0000,003C,0180,0A10,0000,10D8       ;2768   =0      LAB_R[2],J/T118L12             ; CONTINUE TESTING
                                            ;2769
                                            ;2770
                                            ;2771   ;//////////////////////////////////////////////////////////////////////
                                            ;2772   ;+
                                            ;2773   ; BYTE 3---ONE SHIFT
                                            ;2774   ;-
                                            ;2775
U 10E3, 0018,0038,0980,0AA0,0000,10E4       ;2776   T118SD: R[4]_K[.2]                     ; SET THE LOOP COUNT
U 10E4, 0000,003D,0180,0800,0000,134F       ;2777   =0      SUBTEST
U 10E5, 0000,003C,0180,0A00,0000,1391       ;2778           LAB_R[0]
U 1391, 0018,0014,0580,0A80,0000,10E6       ;2779           R[0]_LA+K[.1]                  ; SET NEW BYTE ADDRESS
U 10E6, 0000,003D,6580,0A08,0000,1354       ;2780   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 10E7, 0000,003C,0180,AA18,0000,10E8       ;2781           CACHE.P_D[LONG],LAB_R[3]
```

```
                                              ;2782
                                              ;2783    =0
U 10E8, 0000,003D,0180,09F0,0000,1335         ;2784    T118L13:ERLOOP,RC[OE]_LA                 ; SAVE EXPECTED ADDRESS
U 10E9, 0810,0038,0180,0970,0000,10EA         ;2785            D_RC[OE]                         ; PUT IT IN D REG
U 10EA, 2000,003D,0180,0A08,4200,1364         ;2786    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10EB, D000,003C,0180,0800,0000,1392         ;2787    SYNC12: IBC7CLR.1
U 1392, 4000,003C,0180,0800,0000,10EC         ;2788            IBC/CLR.0.1
U 10EC, C000,003D,0180,0800,0000,1363         ;2789    =0      IBC/CLR.0,CALL,J/DISPAT          ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 10ED, 001D,A000,0180,0800,0010,1393         ;2790            ALU_Q-D,CLK.UBCC,BYTE            ; DATA OK?
U 1393, 0000,013C,0180,0A00,0200,10EE         ;2791            Z?,VA_R[0]                       ; BRANCH IF YES
U 10EE, 0001,A03D,0180,09E8,0000,1336         ;2792    =0      ERRORT,RC[OD]_Q,BYTE             ;
U 10EF, 0000,003C,0180,0800,0000,10F0         ;2793            NOP
U 10F0, 0000,003D,0180,0A08,0000,135A         ;2794    =0      LAB_R[1],CALL,J/SETUPFF          ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 10F1, 0018,0000,0580,0AA0,0010,1394         ;2795            R[4]_LA-K[.1],CLK.UBCC           ; CHECK THE LOOP COUNT
U 1394, 0000,013C,0180,0800,0000,10F2         ;2796            Z?                               ; BRANCH IF LOOP FINISHED
U 10F2, 0000,003C,0180,0A10,0000,10E8         ;2797    =0      LAB_R[2],J/T118L13               ; CONTINUE TESTING
                                              ;2798
                                              ;2799
                                              ;2800    ;//////////////////////////////////////////////////////////////////////
                                              ;2801    ;+
                                              ;2802    ; BYTE 3---TWO SHIFT
                                              ;2803    ;-
                                              ;2804
U 10F3, 0018,0038,0980,0AA0,0000,10F4         ;2805    T118SE: R[4]_K[.2]                       ; SET THE LOOP COUNT
U 10F4, 0000,003D,0180,0800,0000,134F         ;2806    =0      SUBTEST
U 10F5, 0000,003C,0180,0A00,0000,1395         ;2807            LAB_R[0]
U 1395, 0018,0014,0580,0A80,0000,10F6         ;2808            R[0]_LA+K[.1]                    ; SET NEW BYTE ADDRESS
U 10F6, 0000,003D,6580,0A08,0000,1354         ;2809    -0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 10F7, 0000,003C,0180,AA18,0000,10F8         ;2810            CACHE.P_D[LONG],LAB_R[3]
                                              ;2811
                                              ;2812    =0
U 10F8, 0000,003D,0180,09F0,0000,1335         ;2813    T118L14:ERLOOP,RC[OE]_LA                 ; SAVE EXPECTED ADDRESS
U 10F9, 0810,0038,0180,0970,0000,10FA         ;2814            D_RC[OE]                         ; PUT IT IN D REG
U 10FA, 2000,003D,0180,0A08,4200,1364         ;2815    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10FB, 4000,003C,0180,0800,0000,1396         ;2816    SYNC13: IBC7CLR.0.1
U 1396, 4000,003C,0180,0800,0000,10FC         ;2817            IBC/CLR.0.1
U 10FC, C000,003D,0180,0800,0000,1363         ;2818    =0      IBC/CLR.0,CALL,J/DISPAT          ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 10FD, 001D,A000,0180,0800,0010,1397         ;2819            ALU_Q-D,CLK.UBCC,BYTE            ; DATA OK?
U 1397, 0000,013C,0180,0A00,0200,10FE         ;2820            Z?,VA_R[0]                       ; BRANCH IF YES
U 10FE, 0001,A03D,0180,09E8,0000,1336         ;2821    =0      ERRORT,RC[OD]_Q,BYTE             ;
U 10FF, 0000,003C,0180,0800,0000,110A         ;2822            NOP
U 110A, 0000,003D,0180,0A08,0000,135A         ;2823    =0      LAB_R[1],CALL,J/SETUPFF          ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 110B, 0018,0000,0580,0AA0,0010,1398         ;2824            R[4]_LA-K[.1],CLK.UBCC           ; CHECK THE LOOP COUNT
U 1398, 0000,013C,0180,0800,0000,1110         ;2825            Z?                               ; BRANCH IF LOOP FINISHED
U 1110, 0000,003C,0180,0A10,0000,10F8         ;2826    =0      LAB_R[2],J/T118L14               ; CONTINUE TESTING
                                              ;2827
                                              ;2828
                                              ;2829    ;//////////////////////////////////////////////////////////////////////
                                              ;2830    ;+
                                              ;2831    ; BYTE 3---FOUR SHIFT
                                              ;2832    ;-
                                              ;2833
U 1111, 0018,0038,0980,0AA0,0000,1112         ;2834    T118SF: R[4]_K[.2]                       ; SET THE LOOP COUNT
U 1112, 0000,003D,0180,0800,0000,134F         ;2835    =0      SUBTEST
U 1113, 0000,003C,0180,0A00,0000,1399         ;2836            LAB_R[0]
```

```
U 1399, 0018,0014,0980,0A80,0000,1114    ;2837            R[0]_LA+K[.2]                       ; SET ADR OF NEW BYTE
U 1114, 0000,003D,6580,0A08,0000,1354    ;2838    =0      LAB_R[1],KMX/.10,CALL,J/SETUP00   ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1115, 0000,003C,0180,AA18,0000,1116    ;2839            CACHE.P_D[LONG],LAB_R[3]
                                         ;2840
                                         ;2841    =0
U 1116, 0000,003D,0180,09F0,0000,1335    ;2842    T118L15:ERLOOP,RC[0E]_LA            ; SAVE EXPECTED ADDRESS
U 1117, 0810,0038,0180,0970,0000,1118    ;2843            D_RC[0E]                    ; PUT IT IN D REG
U 1118, 2000,003D,0180,0A08,4200,1364    ;2844    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1119, E000,003C,0180,0800,0000,139A    ;2845    SYNC14: IBC7CLR.0-3
U 139A, 4000,003C,0180,0800,0000,111A    ;2846            IBC/CLR.0.1
U 111A, C000,003D,0180,0800,0000,1363    ;2847    =0      IBC/CLR.0,CALL,J/DISPAT         ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 111B, 001D,A000,0180,0800,0010,139B    ;2848            ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 139B, 0000,013C,0180,0A00,0200,111C    ;2849            Z?,VA_R[0]                      ; BRANCH IF YES
U 111C, 0001,A03D,0180,09E8,0000,1336    ;2850    =0      ERRORT,RC[0D]_Q,BYTE            ;
U 111D, 0000,003C,0180,0800,0000,111E    ;2851            NOP
U 111E, 0000,003D,0180,0A08,0000,135A    ;2852    =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 111F, 0018,0000,0580,0AA0,0010,139C    ;2853            R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 139C, 0000,013C,0180,0800,0000,1120    ;2854            Z?                              ; BRANCH IF LOOP FINISHED
U 1120, 0000,003C,0180,0A10,0000,1116    ;2855    =0      LAB_R[2],J/T118L15              ; CONTINUE TESTING
                                         ;2856
                                         ;2857
                                         ;2858    ;///////////////////////////////////////////////////////////////////////
                                         ;2859    ;+
                                         ;2860    ; BYTE 4---NO SHIFT
                                         ;2861    ;-
                                         ;2862
U 1121, 0018,0038,1180,0A80,0000,1122    ;2863    T118S10:R[0]_K[.4]                          ; SET ADR OF BYTE UNDER TEST
U 1122, 0000,003D,0180,0800,0000,134F    ;2864    =0      SUBTEST
U 1123, 0018,0038,0980,0AA0,0000,1124    ;2865            R[4]_K[.2]                          ; SET THE LOOP COUNT
U 1124, 0000,003D,6580,0A08,0000,1354    ;2866    =0      LAB_R[1],KMX/.10,CALL,J/SETUP00   ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1125, 0000,003C,0180,AA18,0000,1126    ;2867            CACHE.P_D[LONG],LAB_R[3]
                                         ;2868
                                         ;2869    =0
U 1126, 0000,003D,0180,09F0,0000,1335    ;2870    T118L16:ERLOOP,RC[0E]_LA            ; SAVE EXPECTED ADDRESS
U 1127, 0810,0038,0180,0970,0000,1128    ;2871            D_RC[0E]                    ; PUT IT IN D REG
U 1128, 2000,003D,0180,0A08,4200,1364    ;2872    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1129, 0000,003C,0180,0800,0000,112A    ;2873    SYNC15: NOP
U 112A, E000,003D,0180,0800,0000,1363    ;2874    =0      IBC/CLR.0-3,CALL,J/DISPAT       ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 112B, 001D,A000,0180,0800,0010,139D    ;2875            ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 139D, 0000,013C,0180,0A00,0200,112C    ;2876            Z?,VA_R[0]                      ; BRANCH IF YES
U 112C, 0001,A03D,0180,09E8,0000,1336    ;2877    =0      ERRORT,RC[0D]_Q,BYTE            ;
U 112D, 0000,003C,0180,0800,0000,112E    ;2878            NOP
U 112E, 0000,003D,0180,0A08,0000,135A    ;2879    =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 112F, 0018,0000,0580,0AA0,0010,139E    ;2880            R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 139E, 0000,013C,0180,0800,0000,1130    ;2881            Z?                              ; BRANCH IF LOOP FINISHED
U 1130, 0000,003C,0180,0A10,0000,1126    ;2882    =0      LAB_R[2],J/T118L16              ; CONTINUE TESTING
                                         ;2883
                                         ;2884
                                         ;2885    ;//////////////////////////////////////////////////////////////////////'/
                                         ;2886    ;+
                                         ;2887    ; BYTE 4---ONE SHIFT
                                         ;2888    ;-
                                         ;2889
U 1131, 0018,0038,0980,0AA0,0000,1132    ;2890    T118S11:R[4]_K[.2]                          ; SET THE LOOP COUNT
U 1132, 0000,003D,0180,0800,0000,134F    ;2891    =0      SUBTEST
```

```
U 1133, 0000,003C,0180,0A00,0000,139F   ;2892           LAB_R[0]
U 139F, 0018,0014,0580,0A80,0000,1134   ;2893           R[0]_LA+K[.1]                   ; SET NEW BYTE ADDRESS
U 1134, 0000,003D,6580,0A08,0000,1354   ;2894   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1135, 0000,003C,0180,AA18,0000,1136   ;2895           CACHE.P_D[LONG],LAB_R[3]
                                        ;2896
                                        ;2897   =0
U 1136, 0000,003D,0180,09F0,0000,1335   ;2898   T118L17:ERLOOP,RC[0E]_LA                ; SAVE EXPECTED ADDRESS
U 1137, 0810,0038,0180,0970,0000,1138   ;2899           D_RC[0E]                        ; PUT IT IN D REG
U 1138, 2000,003D,0180,0A08,4200,1364   ;2900   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1139, D000,003C,0180,0800,0000,13A0   ;2901   SYNC16: IBC/CLR.1
U 13A0, C000,003C,0180,0800,0000,13A1   ;2902           IBC/CLR.0
U 13A1, C000,003C,0180,0800,0000,113A   ;2903           IBC/CLR.0
U 113A, 4000,003D,0180,0800,0000,1363   ;2904   =0      IBC/CLR.0.1,CALL,J/DISPAT       ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 113B, 001D,A000,0180,0800,0010,13A2   ;2905           ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 13A2, 0000,013C,0180,0A00,0200,113C   ;2906           Z?,VA_R[0]                      ; BRANCH IF YES
U 113C, 0001,A03D,0180,09E8,0000,1336   ;2907   =0      ERRORT,RC[0D]_Q,BYTE            ;
U 113D, 0000,003C,0180,0800,0000,113E   ;2908           NOP
U 113E, 0000,003D,0180,0A08,0000,135A   ;2909   =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 113F, 0018,0000,0580,0AA0,0010,13A3   ;2910           R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 13A3, 0000,013C,0180,0800,0000,1140   ;2911           Z?                              ; BRANCH IF LOOP FINISHED
U 1140, 0000,003C,0180,0A10,0000,1136   ;2912   =0      LAB_R[2],J/T118L17              ; CONTINUE TESTING
                                        ;2913
                                        ;2914
                                        ;2915   ;////////////////////////////////////////////////////////////////////////
                                        ;2916   ;+
                                        ;2917   ; BYTE 4---TWO SHIFT
                                        ;2918   ;-
                                        ;2919
U 1141, 0018,0038,0980,0AA0,0000,1142   ;2920   T118S12:R[4]_K[.2]                      ; SET THE LOOP COUNT
U 1142, 0000,003D,0180,0800,0000,134F   ;2921   =0      SUBTEST
U 1143, 0000,003C,0180,0A00,0000,13A4   ;2922           LAB_R[0]
U 13A4, 0018,0014,0580,0A80,0000,1144   ;2923           R[0]_LA+K[.1]                   ; SET NEW BYTE ADDRESS
U 1144, 0000,003D,6580,0A08,0000,1354   ;2924   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1145, 0000,003C,0180,AA18,0000,1146   ;2925           CACHE.P_D[LONG],LAB_R[3]
                                        ;2926
                                        ;2927   =0
U 1146, 0000,003D,0180,09F0,0000,1335   ;2928   T118L18:ERLOOP,RC[0E]_LA                ; SAVE EXPECTED ADDRESS
U 1147, 0810,0038,0180,0970,0000,1148   ;2929           D_RC[0E]                        ; PUT IT IN D REG
U 1148, 2000,003D,0180,0A08,4200,1364   ;2930   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1149, 4000,003C,0180,0800,0000,114A   ;2931   SYNC17: IBC/CLR.0.1
U 114A, E000,003D,0180,0800,0000,1363   ;2932   =0      IBC/CLR.0-3,CALL,J/DISPAT       ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 114B, 001D,A000,0180,0800,0010,13A5   ;2933           ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 13A5, 0000,013C,0180,0A00,0200,114C   ;2934           Z?,VA_R[0]                      ; BRANCH IF YES
U 114C, 0001,A03D,0180,09E8,0000,1336   ;2935   =0      ERRORT,RC[0D]_Q,BYTE            ;
U 114D, 0000,003C,0180,0800,0000,114E   ;2936           NOP
U 114E, 0000,003D,0180,0A08,0000,135A   ;2937   =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 114F, 0018,0000,0580,0AA0,0010,13A6   ;2938           R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 13A6, 0000,013C,0180,0800,0000,1150   ;2939           Z?                              ; BRANCH IF LOOP FINISHED
U 1150, 0000,003C,0180,0A10,0000,1146   ;2940   =0      LAB_R[2],J/T118L18              ; CONTINUE TESTING
                                        ;2941
                                        ;2942
                                        ;2943   ;////////////////////////////////////////////////////////////////////////
                                        ;2944   ;+
                                        ;2945   ; BYTE 4---FOUR SHIFT
                                        ;2946   ;-
                                        ;2947
U 1151, 0018,0038,0980,0AA0,0000,1152   ;2948   T118S13:R[4]_K[.2]                   ; SET THE LOOP COUNT
U 1152, 0818,0039,5D80,0800,0000,1348   ;2949   =0      D_K[.7],CALL,J/DCE
U 1153, 0001,003C,0180,0AA8,0000,13A7   ;2950           R[5]_D                       ; SAVE
U 13A7, 0001,003C,0180,0A98,0000,1156   ;2951           R[3]_D                       ; SET EXP ADR TO INVALID OP CODE
U 1156, 0000,003D,0180,0800,0000,134F   ;2952   =0      SUBTEST
U 1157, 0000,003C,0180,0A00,0000,13A8   ;2953           LAB_R[0]
U 13A8, 0018,0014,0980,0A80,0000,1158   ;2954           R[0]_LA+K[.2]                ; SET ADR OF NEW BYTE
U 1158, 0000,003D,6580,0A08,0000,1354   ;2955   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 1159, 0000,003C,0180,AA18,0000,115A   ;2956           CACHE.P_D[LONG],LAB_R[3]
                                        ;2957
                                        ;2958   =0
U 115A, 0000,003D,0180,09F0,0000,1335   ;2959   T118L19:ERLOOP,RC[0E]_LA             ; SAVE EXPECTED ADDRESS
U 115B, 0810,0038,0180,0970,0000,115C   ;2960           D_RC[0E]                     ; PUT IT IN D REG
U 115C, 2000,003D,0180,0A08,4200,1364   ;2961   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 115D, E000,003C,0180,0800,0000,115E   ;2962   SYNC18: IBC7CLR.0-3
U 115E, E000,003D,0180,0800,0000,1363   ;2963   =0      IBC/CLR.0-3,CALL,J/DISPAT    ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 115F, 001D,A000,0180,0800,0010,13A9   ;2964           ALU_Q-D,CLK.UBCC,BYTE        ; DATA OK?
U 13A9, 0000,013C,0180,0A00,0200,1160   ;2965           Z?,VA_R[0]                   ; BRANCH IF YES
U 1160, 0001,A03D,0180,09E8,0000,1336   ;2966   =0      ERRORT,RC[0D]_Q,BYTE         ;
U 1161, 0000,003C,0180,0800,0000,1162   ;2967           NOP
U 1162, 0000,003D,0180,0A08,0000,135A   ;2968   =0      LAB_R[1],CALL,J/SETUPFF      ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1163, 0018,0000,0580,0AA0,0010,13AA   ;2969           R[4]_LA-K[.1],CLK.UBCC       ; CHECK THE LOOP COUNT
U 13AA, 0000,013C,0180,0800,0000,1164   ;2970           Z?                           ; BRANCH IF LOOP FINISHED
U 1164, 0000,003C,0180,0A18,0000,115A   ;2971   =0      LAB_R[3],J/T118L19           ; CONTINUE TESTING
U 1165, 0000,003C,0180,0800,0000,1166   ;2972           NOP
                                        ;2973
                                        ;2974
                                        ;2975   ;///////////////////////////////////////////////////////////////////////
                                        ;2976   ;+
                                        ;2977   ; BYTE 5---ZERO SHIFT
                                        ;2978   ;-
                                        ;2979
                                        ;2980   =0
U 1166, 0818,0038,1180,0800,0000,1167   ;2981   T118S14:D_K[.4]
U 1167, 0019,0014,0580,0A80,0000,1168   ;2982           R[0]_D+K[.1]
U 1168, 0000,003D,0180,0800,0000,134F   ;2983   =0      SUBTEST
U 1169, 0018,0038,0980,0AA0,0000,13AB   ;2984           R[4]_K[.2]                   ; SET THE LOOP COUNT
U 13AB, 0018,0038,1D80,0A98,0000,116A   ;2985           R[3]_ALU,ALU_SC              ; SET EXP ADDRESS
U 116A, 0000,003D,6580,0A08,0000,1354   ;2986   =0      LAB_R[1],KMX7.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 116B, 0000,003C,0180,AA18,0000,116C   ;2987           CACHE.P_D[LONG],LAB_R[3]
                                        ;2988
                                        ;2989   =0
U 116C, 0000,003D,0180,09F0,0000,1335   ;2990   T118L20:ERLOOP,RC[0E]_LA             ; SAVE EXPECTED ADDRESS
U 116D, 0810,0038,0180,0970,0000,116E   ;2991           D_RC[0E]                     ; PUT IT IN D REG
U 116E, 2000,003D,0180,0A08,4200,1364   ;2992   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 116F, 0000,003C,0180,0800,0000,13AC   ;2993   SYNC19: NOP
U 13AC, E000,003C,0180,0800,0000,1170   ;2994           IBC/CLR.0-3
U 1170, C000,003D,0180,0800,0000,1363   ;2995   =0      IBC/CLR.0,CALL,J/DISPAT ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 1171, 001D,A000,0180,0800,0010,13AD   ;2996           ALU_Q-D,CLK.UBCC,BYTE        ; DATA OK?
U 13AD, 0000,013C,0180,0A00,0200,1172   ;2997           Z?,VA_R[0]                   ; BRANCH IF YES
U 1172, 0001,A03D,0180,09E8,0000,1336   ;2998   =0      ERRORT,RC[0D]_Q,BYTE         ;
U 1173, 0000,003C,0180,0800,0000,1174   ;2999           NOP
U 1174, 0000,003D,0180,0A08,0000,135A   ;3000   =0      LAB_R[1],CALL,J/SETUPFF      ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1175, 0018,0000,0580,0AA0,0010,13AE   ;3001           R[4]_LA-K[.1],CLK.UBCC       ; CHECK THE LOOP COUNT
```

```
U 13AE, 0000,013C,0180,0800,0000,1176   ;3002           Z?                              ; BRANCH IF LOOP FINISHED
U 1176, 0000,003C,0180,0A10,0000,116C   ;3003   =0      LAB_R[2],J/T118L20              ; CONTINUE TESTING
                                        ;3004
                                        ;3005
                                        ;3006   ;//////////////////////////////////////////////////////////////////////
                                        ;3007   ;+
                                        ;3008   ; BYTE 5---ONE SHIFT
                                        ;3009   ;-
                                        ;3010
U 1177, 0018,0038,0980,0AA0,0000,1178   ;3011   T118S15:R[4]_K[.2]                      ; SET THE LOOP COUNT
U 1178, 0000,003D,0180,0800,0000,134F   ;3012   =0      SUBTEST
U 1179, 0000,003C,0180,0A00,0000,13AF   ;3013           LAB_R[0]
U 13AF, 0018,0014,0580,0A80,0000,117A   ;3014           R[0]_LA+K[.1]                   ; SET NEW BYTE ADDRESS
U 117A, 0000,003D,6580,0A08,0000,1354   ;3015   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 117B, 0000,003C,0180,AA18,0000,117C   ;3016           CACHE.P_D[LONG],LAB_R[3]
                                        ;3017
                                        ;3018   =0
U 117C, 0000,003D,0180,09F0,0000,1335   ;3019   T118L21:ERLOOP,RC[0E]_LA                ; SAVE EXPECTED ADDRESS
U 117D, 0810,0038,0180,0970,0000,117E   ;3020           D_RC[0E]                        ; PUT IT IN D REG
U 117E, 2000,003D,0180,0A08,4200,1364   ;3021   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 117F, D000,003C,0180,0800,0000,13B0   ;3022   SYNC1A: IBC7CLR.1
U 13B0, E000,003C,0180,0800,0000,1180   ;3023           IBC/CLR.0-3
U 1180, C000,003D,0180,0800,0000,1363   ;3024   =0      IBC/CLR.0,CALL,J/DISPAT         ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 1181, 001D,A000,0180,0800,0010,13B1   ;3025           ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 13B1, 0000,013C,0180,0A00,0200,1182   ;3026           Z?,VA_R[0]                      ; BRANCH IF YES
U 1182, 0001,A03D,0180,09E8,0000,1336   ;3027   =0      ERRORT,RC[0D]_Q,BYTE            ;
U 1183, 0000,003C,0180,0800,0000,1184   ;3028           NOP
U 1184, 0000,003D,0180,0A08,0000,135A   ;3029   =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1185, 0018,0000,0580,0AA0,0010,13B2   ;3030           R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 13B2, 0000,013C,0180,0800,0000,1186   ;3031           Z?                              ; BRANCH IF LOOP FINISHED
U 1186, 0000,003C,0180,0A10,0000,117C   ;3032   =0      LAB_R[2],J/T118L21              ; CONTINUE TESTING
                                        ;3033
                                        ;3034
                                        ;3035   ;//////////////////////////////////////////////////////////////////////
                                        ;3036   ;+
                                        ;3037   ; BYTE 5---TWO SHIFT
                                        ;3038   ;-
                                        ;3039
U 1187, 0018,0038,0980,0AA0,0000,1188   ;3040   T118S16:R[4]_K[.2]                      ; SET THE LOOP COUNT
U 1188, 0000,003D,0180,0800,0000,134F   ;3041   =0      SUBTEST
U 1189, 0000,003C,0180,0A00,0000,13B3   ;3042           LAB_R[0]
U 13B3, 0018,0014,0580,0A80,0000,118A   ;3043           R[0]_LA+K[.1]                   ; SET NEW BYTE ADDRESS
U 118A, 0000,003D,6580,0A08,0000,1354   ;3044   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 118B, 0000,003C,0180,AA18,0000,118C   ;3045           CACHE.P_D[LONG],LAB_R[3]
                                        ;3046
                                        ;3047   =0
U 118C, 0000,003D,0180,09F0,0000,1335   ;3048   T118L22:ERLOOP,RC[0E]_LA                ; SAVE EXPECTED ADDRESS
U 118D, 0810,0038,0180,0970,0000,118E   ;3049           D_RC[0E]                        ; PUT IT IN D REG
U 118E, 2000,003D,0180,0A08,4200,1364   ;3050   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 118F, 4000,003C,0180,0800,0000,13B4   ;3051   SYNC1B: IBC7CLR.0.1
U 13B4, E000,003C,0180,0800,0000,1190   ;3052           IBC/CLR.0-3
U 1190, C000,003D,0180,0800,0000,1363   ;3053   =0      IBC/CLR.0,CALL,J/DISPAT         ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 1191, 001D,A000,0180,0800,0010,13B5   ;3054           ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 13B5, 0000,013C,0180,0A00,0200,1192   ;3055           Z?,VA_R[0]                      ; BRANCH IF YES
U 1192, 0001,A03D,0180,09E8,0000,1336   ;3056   =0      ERRORT,RC[0D]_Q,BYTE            ;
```

```
U 1193, 0000,003C,0180,0800,0000,1194   ;3057           NOP
U 1194, 0000,003D,0180,0A08,0000,135A   ;3058   =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 1195, 0018,0000,0580,0AA0,0010,13B6   ;3059           R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 13B6, 0000,013C,0180,0800,0000,1196   ;3060           Z?                              ; BRANCH IF LOOP FINISHED
U 1196, 0000,003C,0180,0A10,0000,118C   ;3061   =0      LAB_R[2],J/T118L22              ; CONTINUE TESTING
                                        ;3062
                                        ;3063
                                        ;3064   ;//////////////////////////////////////////////////////////////////////
                                        ;3065   ;+
                                        ;3066   ; BYTE 5---FOUR SHIFT
                                        ;3067   ;-
                                        ;3068
U 1197, 0018,0038,0980,0AA0,0000,1198   ;3069   T118S17:R[4]_K[.2]                      ; SET THE LOOP COUNT
U 1198, 0000,003D,0180,0800,0000,134F   ;3070   =0      SUBTEST
U 1199, 0000,003C,0180,0A28,0000,13B7   ;3071           LAB_R[5]                        ; GET INVALID OP CODE ADR
U 13B7, 0000,003C,0180,0A98,0000,13B8   ;3072           R[3]_LA                         ; SET EXP ADDRESS
U 13B8, 0000,003C,0180,0A00,0000,13B9   ;3073           LAB_R[0]
U 13B9, 0018,0014,0980,0A80,0000,119A   ;3074           R[0]_LA+K[.2]                   ; SET ADR OF NEW BYTE
U 119A, 0000,003D,6580,0A08,0000,1354   ;3075   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 119B, 0000,003C,0180,AA18,0000,119C   ;3076           CACHE.P_D[LONG],LAB_R[3]
                                        ;3077
                                        ;3078   =0
U 119C, 0000,003D,0180,09F0,0000,1335   ;3079   T118L23:ERLOOP,RC[0E]_LA                ; SAVE EXPECTED ADDRESS
U 119D, 0810,0038,0180,0970,0000,119E   ;3080           D_RC[0E]                        ; PUT IT IN D REG
U 119E, 2000,003D,0180,0A08,4200,1364   ;3081   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 119F, E000,003C,0180,0800,0000,13BA   ;3082   SYNC1C: IBC7CLR.0-3
U 13BA, E000,003C,0180,0800,0000,11A0   ;3083           IBC/CLR.0-3
U 11A0, C000,003D,0180,0800,0000,1363   ;3084   =0      IBC/CLR.0,CALL,J/DISPAT         ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 11A1, 001D,A000,0180,0800,0010,13BB   ;3085           ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 13BB, 0000,013C,0180,0A00,0200,11A2   ;3086           Z?,VA_R[0]                      ; BRANCH IF YES
U 11A2, 0001,A03D,0180,09E8,0000,1336   ;3087   =0      ERRORT,RC[0D]_Q,BYTE            ;
U 11A3, 0000,003C,0180,0800,0000,11A4   ;3088           NOP
U 11A4, 0000,003D,0180,0A08,0000,135A   ;3089   =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 11A5, 0018,0000,0580,0AA0,0010,13BC   ;3090           R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 13BC, 0000,013C,0180,0800,0000,11A6   ;3091           Z?                              ; BRANCH IF LOOP FINISHED
U 11A6, 0000,003C,0180,0A18,0000,119C   ;3092   =0      LAB_R[3],J/T118L23              ; CONTINUE TESTING
                                        ;3093
                                        ;3094
                                        ;3095   ;//////////////////////////////////////////////////////////////////////
                                        ;3096   ;+
                                        ;3097   ; BYTE 6---ZERO SHIFT
                                        ;3098   ;-
                                        ;3099
U 11A7, 0018,0038,D580,0A80,0000,11A8   ;3100   T118S18:R[0]_K[.6]                      ; SET NEW BYTE ADDRESS
U 11A8, 0000,003D,0180,0800,0000,134F   ;3101   =0      SUBTEST
U 11A9, 0018,0038,0980,0AA0,0000,13BD   ;3102           R[4]_K[.2]                      ; SET THE LOOP COUNT
U 13BD, 0018,0038,1D80,0A98,0000,11AA   ;3103           R[3]_ALU,ALU_SC
U 11AA, 0000,003D,6580,0A08,0000,1354   ;3104   =0      LAB_R[1],KMX7.10,CALL,J/SETUP00  ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 11AB, 0000,003C,0180,AA18,0000,11AC   ;3105           CACHE.P_D[LONG],LAB_R[3]
                                        ;3106
                                        ;3107   =0
U 11AC, 0000,003D,0180,09F0,0000,1335   ;3108   T118L24:ERLOOP,RC[0E]_LA                ; SAVE EXPECTED ADDRESS
U 11AD, 0810,0038,0180,0970,0000,11AE   ;3109           D_RC[0E]                        ; PUT IT IN D REG
U 11AE, 2000,003D,0180,0A08,4200,1364   ;3110   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11AF, 0000,003C,0180,0800,0000,13BE   ;3111   SYNC1D: NOP
```

```
U 13BE, E000,003C,0180,0800,0000,11B0   ;3112           IBC/CLR.0-3
U 11B0, 4000,003D,0180,0800,0000,1363   ;3113   =0      IBC/CLR.0.1,CALL,J/DISPAT       ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 11B1, 001D,A000,0180,0800,0010,13BF   ;3114           ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 13BF, 0000,013C,0180,0A00,0200,11B2   ;3115           Z?,VA_R[0]                      ; BRANCH IF YES
U 11B2, 0001,A03D,0180,09E8,0000,1336   ;3116   =0      ERRORT,RC[OD]_Q,BYTE            ;
U 11B3, 0000,003C,0180,0800,0000,11B4   ;3117           NOP
U 11B4, 0000,003D,0180,0A08,0000,135A   ;3118   =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 11B5, 0018,0000,0580,0AA0,0010,13C0   ;3119           R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 13C0, 0000,013C,0180,0800,0000,11B6   ;3120           Z?                              ; BRANCH IF LOOP FINISHED
U 11B6, 0000,003C,0180,0A10,0000,11AC   ;3121   =0      LAB_R[2],J/T118L24              ; CONTINUE TESTING
                                        ;3122
                                        ;3123
                                        ;3124   ;//////////////////////////////////////////////////////////////////////////
                                        ;3125   ;+
                                        ;3126   ; BYTE 6---ONE SHIFT
                                        ;3127   ;-
                                        ;3128
U 11B7, 0018,0038,0980,0AA0,0000,11B8   ;3129   T118S19:R[4]_K[.2]                      ; SET THE LOOP COUNT
U 11B8, 0000,003D,0180,0800,0000,134F   ;3130   =0      SUBTEST
U 11B9, 0000,003C,0180,0A00,0000,13C1   ;3131           LAB_R[0]
U 13C1, 0018,0014,0580,0A80,0000,11BA   ;3132           R[0]_LA+K[.1]                   ; SET NEW BYTE ADDRESS
U 11BA, 0000,003D,6580,0A08,0000,1354   ;3133   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 11BB, 0000,003C,0180,AA18,0000,11BC   ;3134           CACHE.P_D[LONG],LAB_R[3]
                                        ;3135
                                        ;3136   =0
U 11BC, 0000,003D,0180,09F0,0000,1335   ;3137   T118L25:ERLOOP,RC[OE]_LA                ; SAVE EXPECTED ADDRESS
U 11BD, 0810,0038,0180,0970,0000,11BE   ;3138           D_RC[OE]                        ; PUT IT IN D REG
U 11BE, 2000,003D,0180,0A08,4200,1364   ;3139   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11BF, D000,003C,0180,0800,0000,13C2   ;3140   SYNC1E: IBC7CLR.1
U 13C2, E000,003C,0180,0800,0000,13C3   ;3141           IBC/CLR.0-3
U 13C3, C000,003C,0180,0800,0000,11C0   ;3142           IBC/CLR.0
U 11C0, C000,003D,0180,0800,0000,1363   ;3143   =0      IBC/CLR.0,CALL,J/DISPAT         ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 11C1, 001D,A000,0180,0800,0010,13C4   ;3144           ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 13C4, 0000,013C,0180,0A00,0200,11C2   ;3145           Z?,VA_R[0]                      ; BRANCH IF YES
U 11C2, 0001,A03D,0180,09E8,0000,1336   ;3146   =0      ERRORT,RC[OD]_Q,BYTE            ;
U 11C3, 0000,003C,0180,0800,0000,11C4   ;3147           NOP
U 11C4, 0000,003D,0180,0A08,0000,135A   ;3148   =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 11C5, 0018,0000,0580,0AA0,0010,13C5   ;3149           R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 13C5, 0000,013C,0180,0800,0000,11C6   ;3150           Z?                              ; BRANCH IF LOOP FINISHED
U 11C6, 0000,003C,0180,0A10,0000,11BC   ;3151   =0      LAB_R[2],J/T118L25              ; CONTINUE TESTING
                                        ;3152
                                        ;3153
                                        ;3154   ;//////////////////////////////////////////////////////////////////////////
                                        ;3155   ;+
                                        ;3156   ; BYTE 6---TWO SHIFT
                                        ;3157   ;-
                                        ;3158
U 11C7, 0018,0038,0980,0AA0,0000,11C8   ;3159   T118S1A:R[4]_K[.2]                      ; SET THE LOOP COUNT
U 11C8, 0000,003D,0180,0800,0000,134F   ;3160   =0      SUBTEST
U 11C9, 0000,003C,0180,0A28,0000,13C6   ;3161           LAB_R[5]
U 13C6, 0000,003C,0180,0A98,0000,13C7   ;3162           R[3]_LA
U 13C7, 0000,003C,0180,0A00,0000,13C8   ;3163           LAB_R[0]
U 13C8, 0018,0014,0580,0A80,0000,11CA   ;3164           R[0]_LA+K[.1]                   ; SET NEW BYTE ADDRESS
U 11CA, 0000,003D,6580,0A08,0000,1354   ;3165   =0      LAB_R[1],KMX/.10,CALL,J/SETUP00 ; WRITE A ZERO BYTE IN A FIELD OF ALL ONE'S
U 11CB, 0000,003C,0180,AA18,0000,11CC   ;3166           CACHE.P_D[LONG],LAB_R[3]
```

```
                                                 ;3167
                                                 ;3168   =0
U 11CC, 0000,003D,0180,09F0,0000,1335    ;3169   T118L26:ERLOOP,RC[0E]_LA                ; SAVE EXPECTED ADDRESS
U 11CD, 0810,0038,0180,0970,0000,11CE    ;3170           D_RC[0E]                        ; PUT IT IN D REG
U 11CE, 2000,003D,0180,0A08,4200,1364    ;3171   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11CF, 4000,003C,0180,0800,0000,13C9    ;3172   SYNC1F: IBC7CLR.0.1
U 13C9, E000,003C,0180,0800,0000,11D0    ;3173           IBC/CLR.0-3
U 11D0, 4000,003D,0180,0800,0000,1363    ;3174   =0      IBC/CLR.0.1,CALL,J/DISPAT       ; SEE IF BYTE 0 GETS THE CORRECT DATA
U 11D1, 001D,A000,0180,0800,0010,13CA    ;3175           ALU_Q-D,CLK.UBCC,BYTE           ; DATA OK?
U 13CA, 0000,013C,0180,0A00,0200,11D2    ;3176           Z?,VA_R[0]                      ; BRANCH IF YES
U 11D2, 0001,A03D,0180,09E8,0000,1336    ;3177   =0      ERRORT,RC[0D]_Q,BYTE            ;
U 11D3, 0000,003C,0180,0800,0000,11D4    ;3178           NOP
U 11D4, 0000,003D,0180,0A08,0000,135A    ;3179   =0      LAB_R[1],CALL,J/SETUPFF         ; WRITE A ONE'S BYTE IN A FIELD OF ZERO'S BY
U 11D5, 0018,0000,0580,0AA0,0010,13CB    ;3180           R[4]_LA-K[.1],CLK.UBCC          ; CHECK THE LOOP COUNT
U 13CB, 0000,013C,0180,0800,0000,11D6    ;3181           Z?                              ; BRANCH IF LOOP FINISHED
U 11D6, 0000,003C,0180,0A18,0000,11CC    ;3182   =0      LAB_R[3],J/T118L26              ; CONTINUE TESTING
U 11D7, 0000,003C,0180,0800,0000,11D8    ;3183           NOP
                                                 ;3184
                                                 ;3185
                                                 ;3186   ; THE FOLLOWING DATA IS THE IB DATA PATTERN FOR THE ABOVE TEST:
                                                 ;3187   ;% 0
                                                 ;3188   ;$ FFFF,FFFF,FFFF,FFFF
                                                 ;3189   ;$ 0000,0000,0000,0000
                                                 ;3190
                                                 ;3191
```

```
                                        .PAGE   "TEST 119       VALID BIT GENERATION"
                                        ;******************************************************************
                                        ;++
                                        ; TEST  119     VALID BIT GENERATION
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST CHECKS THAT THE CORRECT BYTES ARE MARKED VALID, WHEN
                                        ;       THEY ARE RECEIVED FROM THE CACHE, AS A FUNCTION OF THE VALUES
                                        ;       OF IBA BITS<1:0>. THIS IS DONE BY LOADING THE IBA WITH THE SPECIFIED
                                        ;       VALUE OF BITS<1:0>, STARTING THE INSTRUCTION BUFFER, WAITING FOR
                                        ;       THE SPECIFIED NUMBER OF CYCLES, FROM THE CACHE, STOPPING THE IB,
                                        ;       AND CHECKING THAT THE APPROPRIATE BYTES WERE MARKED VALID.
                                        ;
                                        ;       SUBTST 1 - CHECK THAT IBA BITS<1:0> VALUES OF 00,01,10, AND 11 AND
                                        ;                  ONLY ONE CACHE READ, VALIDATE BYTES 3-0,2-0,1-0,
                                        ;                  AND 0, RESPECTIVELY.
                                        ;       SUBTST 2 - CHECK THAT AN IBA VALUE OF 11 AND 2 READS FROM THE CACHE
                                        ;                  ONLY VALIDATE BYTES 4-0.
                                        ;       SUBTST 3 - CHECK THAT AN IBA VALUE OF 10 AND 2 READS FROM THE CACHE
                                        ;                  ONLY VALIDATE BYTES 5-0.
                                        ;       SUBTST 4 - CHECK THAT AN IBA VALUE OF 01 AND 2 READS FROM THE CACHE
                                        ;                  ONLY VALIDATE BYTES 6-0.
                                        ;       SUBTST 5 - CHECK THAT AN IBA VALUE OF 11 AND 3 READS FROM CACHE
                                        ;                  VALIDATES THE ENTIRE BUFFER.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS THE VALID BIT GENERATION LOGIC ON THE IDP MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED MICRO PC BITS<7:0>
                                        ;             RECEIVED MICRO PC BITS<7:0>
                                        ;             BYTE LOOP COUNT -- SHOWS WHICH BYTE WAS BEING CHECK FOR VALIDITY:
                                        ;               7=BYTE 0, 6=BYTE 1, 5=BYTE 2, 4=BYTE 3, ETC.
                                        ;             VALID FLAG (SUBTEST 1 ONLY) -- IF SET, THE BYTE BEING CHECKED
                                        ;                                            SHOULD HAVE BEEN INVALID.
                                        ;             IBA BITS<1:0> LOOP COUNT (SUBTEST 1 ONLY) -- SHOWS WHAT VALUE
                                        ;               OF IBA BITS<1:0> ARE BEING TESTED:
                                        ;                 4=00, 3=01, 2=10, AND 1=11
                                        ;       THE EXPECTED ADDRESS WILL EITHER BE 8F (FOR VALID DATA) OR
                                        ;       7E (FOR INVALID DATA).
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       ADDRESS SYNC20 - LOCATION WHEN CACHE DATA IS WRITTEN INTO THE IB
                                        ;                        WHEN 1 READ FROM CACHE IS REQUESTED, OR WHERE
                                        ;                        THE SECOND LONG WORD FROM CACHE IS WRITTEN
                                        ;                        INTO THE IB WHEN 2 READS FROM THE CACHE ARE REQUESTED.
                                        ;       ADDRESS SYNC21 - LOCATION WHEN CACHE DATA IS WRITTEN INTO THE IB
                                        ;                        WHEN 2 READS FROM THE CACHE ARE REQUESTED.
                                        ;--
                                        ;******************************************************************
                                        =0
U 11D8, 0000,003D,0180,0800,0000,105F   T119:   NEWTST
U 11D9, 0818,0038,1180,0800,000C,13CC           D_K[.4]
U 13CC, 0019,0014,0580,09F8,0000,13CD           R[[0F]_D+K[.1]                  ; 5 ARGUMETNS
U 13CD, 0018,0038,2180,0A88,0000,11DA           R[1]_K[.14]
```

```
U 11DA, 0818,0039,0180,0800,0000,1349    ;3247    =0      D_K[.8],CALL,J/DCF                ; GEN ADR OF VALID DATA
U 11DB, 0001,003C,0180,0A90,0000,11DC    ;3248            R[2]_D                            ; SAVE
U 11DC, 0818,0039,5D80,0800,0000,1348    ;3249    =0      D_K[.7],CALL,J/DCE                ; GENERATE THE ADR OF INVALID DATA
U 11DD, 0001,003C,0180,0A98,0000,11DE    ;3250            R[3]_D                            ; SAVE
                                         ;3251
                                         ;3252
                                         ;3253    ;///////////////////////////////////////////////////////////////////////
                                         ;3254    ;+
                                         ;3255    ; IBA VALUES OF 0,1,2,3 AND ONE FETCH FROM MEMORY
                                         ;3256    ;-
                                         ;3257
                                         ;3258    =0
U 11DE, 0000,003D,0180,0800,0000,134F    ;3259    T119S1: SUBTEST
U 11DF, 0018,0038,1180,09D0,0000,11E0    ;3260            RC[0A]_K[.4]                      ; SET THE IBA LOOP COUNT
U 11E0, 0000,003D,0180,0800,0000,1335    ;3261    =0      ERLOOP
U 11E1, 0018,0038,5D80,09E0,0000,13CE    ;3262    T119L4: RC[0C]_K[.7]                      ; SET THE BYTE LOOP COUNT
U 13CE, 0018,0038,7D80,0AA0,0000,13CF    ;3263            R[4]_K[.18]                       ; SET CONST TO DETERMINE HOW MANY VALID BYTE
U 13CF, 0003,003C,0180,09D8,0000,11E2    ;3264            RC[0B]_0                          ; SET THE VALID FLAG
U 11E2, 2000,003D,0180,0A08,4200,136B    ;3265    =0      ALU_R[T],FLUSH.IB,CALL,J/IBWAITONCE ,LOAD THE IB ONCE
U 11E3, 0000,003C,0180,0A10,0000,13D0    ;3266            LAB_R[2]                          ; GET ADR OF VALID DATA
U 13D0, 0800,003C,0180,09F0,0000,11E4    ;3267    T119L1: RC[0E]_LA,D_LA                    ; SAVE EXP ADDRESS
U 11E4, 0000,003D,0180,0800,0000,1363    ;3268    =0      CALL,J7DISPAT                     ; CHECK BYTE 0
U 11E5, 001D,A000,0180,0800,0010,13D1    ;3269            ALU_Q-D,CLK.UBCC,BYTE             ; ADR OK?
U 13D1, 0810,0138,0180,0960,0000,11E6    ;3270            Z?,D_RC[0C]                       ; BRANCH IF YES
U 11E6, 0001,A03D,0180,09E8,0000,1336    ;3271    =0      ERROR1,RC[0D]_Q,BYTE              ;
                                         ;3272
                                         ;3273    ;+
                                         ;3274    ; THE FOLLOWING CODE CONTROLS THE LOOP FOR THIS SUBTEST
                                         ;3275    ;-
                                         ;3276
U 11E7, C019,8000,0580,09E0,0010,13D2    ;3277            RC[0C]_D-K[.1],CLK.UBCC,BYTE,IBC/CLR.0 ; DECREMENT BYTE LOOP COUNT
U 13D2, 0000,1B3C,0180,0958,0000,1007    ;3278            ALU.N?,LC_RC[0B]                  ; BRANCH IF CHECKED 8 BYTES
U 1007, 0000,003C,0180,0800,0000,13D3    ;3279    =0111   J/T119L20                         ; SEE IF TIME TO CHANGE EXP ADR
U 100F, 0810,0038,0180,0950,0000,13D8    ;3280            D_RC[0A],J/T119L3
U 13D3, 0010,8038,0180,0800,0010,13D4    ;3281    T119L20:ALU_LC,CLK.UBCC,BYTE              ; IS VALID FLAG SET?
U 13D4, 0800,013C,0180,0A20,0000,11E8    ;3282            Z?,D_R[4]                         ; BRANCH IF YES
                                         ;3283    =0
U 11E8, 0000,003C,0180,0A18,0000,13D0    ;3284    T119L2: LAB_R[3],J/T119L1                 ; KEEP CHECKING INVALID BYTES
U 11E9, 0819,0000,0580,0AA0,0000,13D5    ;3285            R[4]_D-K[.1],D_ALU                ; DECREMENT CONST FOR VALID CHECK
U 13D5, 0000,003C,0180,0A08,0000,13D6    ;3286            LAB_R[1]                          ; LATCH CURRENT IBA VALUE
U 13D6, 001C,A000,0180,0800,0010,13D7    ;3287            ALU_LA[A-B]D,CLK.UBCC,BYTE                ; ARE CONST AND IBA EQUAL YET?
U 13D7, 0000,013C,0180,0800,0000,11EA    ;3288            Z?                                ; BRANCH IF TIME TO CHECK FOR INVALID BYTES
U 11EA, 0000,003C,0180,0A10,0000,13D0    ;3289    =0      LAB_R[2],J/T119L1                 ; KEEP CHECKING FOR VALID BYTES
U 11EB, 0018,0038,0580,09D8,0000,11E8    ;3290            RC[0B]_K[.1],J/T119L2             ; CLEAR VALID FLAG AND START CHECKING FOR IN
U 13D8, 0019,8000,0580,09D0,0010,13D9    ;3291    T119L3: RC[0A]_D-K[.1],CLK.UBCC,BYTE      ; DECREMENT IBA LOOP COUNT
U 13D9, 0000,013C,0180,0A08,0000,11EC    ;3292            Z?,LAB_R[1]                       ; BRANCH IF DONE
U 11EC, 0018,0014,0580,0A88,0000,11E1    ;3293    =0      R[1]_LA+K[.1],J/T119L4            ; INCREMENT IBA AND CONTINUE
                                         ;3294
                                         ;3295
                                         ;3296    ;///////////////////////////////////////////////////////////////////////
                                         ;3297    ;+
                                         ;3298    ; SET IBA=3 AND ALLOW TWO MEMORY READS
                                         ;3299    ;-
                                         ;3300
U 11ED, 0000,003C,0180,0800,0000,11EE    ;3301            NOP
```

```
U 11EE, 0000,003D,0180,0800,0000,134F    =0      SUBTEST
U 11EF, 0818,0038,2180,0800,0000,13DA    T119S2: D_K[.14]
U 13DA, 0019,0014,0D80,0A88,0000,11F0            R[1]_D+K[.3]                    ; SET IBA = 3
U 11F0, 0000,003D,0D80,0800,0084,7351    =0      SETRCF[.3]
U 11F1, 0000,003C,0180,0800,0000,11F2            NOP
U 11F2, 0000,003D,0180,0800,0000,1335    =0      ERLOOP
U 11F3, 0018,0038,0180,09E0,0000,11F4            RC[0C]_K[.8]                    ; SET THE BYTE LOOP COUNT
U 11F4, 2000,003D,0180,0A08,4200,136C    =0      ALU_R[T],FLUSH.IB,CALL,J/IBTWICE ; LOAD THE IB
U 11F5, 0000,003C,0180,0A10,0000,13DB            LAB_R[2]                        ; GET ADR OF VALID DATA
U 13DB, 0800,003C,0180,09F0,0000,11F6    T119L5: RC[0E]_LA,D_LA                  ; SAVE
U 11F6, 0000,003D,0180,0800,0000,1363    =0      CALL,J7DISPAT                   ; CHECK BYTE 0
U 11F7, 001D,A000,0180,0800,0010,13DC            ALU_Q-D,CLK.UBCC,BYTE           ; ADR OK?
U 13DC, 0810,0138,0180,0960,0000,11F8            Z?,D_RC[0C]                     ; BRANCH IF YES
U 11F8, 0001,A03D,0180,09E8,0000,1336    =0      ERROR1,RC[0D]_Q,BYTE            ;
U 11F9, 0819,8000,0580,09E0,0010,13DD            RC[0C]_D-K[.1],CLK.UBCC,BYTE,D_ALU ; DECREMENT LOOP COUNT
U 13DD, C000,013C,0180,0800,0000,11FA            Z?,IBC7CLR.0                    ; BRANCH IF DONE
U 11FA, 0019,8000,1180,0800,0010,13DE    =0      ALU_D-K[.4],CLK.UBCC,BYTE,J/T119L6 ; SEE IF TIME TO CHECK FOR INVALID BYTES
U 11FB, 0000,003C,0180,0800,0000,11FD            J/T119S3                        ; GO TO NEXT SUB TEST
U 13DE, 0000,1B3C,0180,0800,0000,1017    T119L6: ALU.N?                          ; BRANCH IF TIME FOR INVALID BYTES
U 1017, 0000,003C,0180,0A10,0000,13DB    =0111   LAB_R[2],J/T119L5               ; KEEP CHECKING VALID BYTES
U 101F, 0000,003C,0180,0A18,0000,13DB            LAB_R[3],J/T119L5               ; CHECK INVALID BYTES


                                         ;/////////////////////////////////////////////////////////////////////////
                                         ;+
                                         ; IBA=2 AND TWO MEMORY READS
                                         ;-

U 11FC, 0000,003D,0180,0800,0000,134F    =0      SUBTEST
U 11FD, 0800,003C,0180,0A08,0000,13DF    T119S3: D_R[1]
U 13DF, 0019,0000,0580,0A88,0000,11FE            R[1]_D-K[.1]                    ; SET IBA EQUAL TO 2
U 11FE, 0000,003D,0180,0800,0000,1335    =0      ERLOOP
U 11FF, 0018,0038,0180,09E0,0000,1300            RC[0C]_K[.8]                    ; SET THE BYTE LOOP COUNT
U 1300, 2000,003D,0180,0A08,4200,136C    =0      ALU_R[T],FLUSH.IB,CALL,J/IBTWICE ; LOAD THE IB
U 1301, 0000,003C,0180,0A10,0000,13E0            LAB_R[2]                        ; GET ADR OF VALID DATA
U 13E0, 0800,003C,0180,09F0,0000,1302    T119L7: RC[0E]_LA,D_LA                  ; SAVE
U 1302, 0000,003D,0180,0800,0000,1363    =0      CALL,J7DISPAT                   ; CHECK BYTE 0
U 1303, 001D,A000,0180,0800,0010,13E1            ALU_Q-D,CLK.UBCC,BYTE           ; ADR OK?
U 13E1, 0810,0138,0180,0960,0000,1304            Z?,D_RC[0C]                     ; BRANCH IF YES
U 1304, 0001,A03D,0180,09E8,0000,1336    =0      ERROR1,RC[0D]_Q,BYTE            ;
U 1305, 0819,8000,0580,09E0,0010,13E2            RC[0C]_D-K[.1],CLK.UBCC,BYTE,D_ALU ; DECREMENT LOOP COUNT
U 13E2, C000,013C,0180,0800,0000,1306            Z?,IBC7CLR.0                    ; BRANCH IF DONE
U 1306, 0019,8000,0D80,0800,0010,13E3    =0      ALU_D-K[.3],CLK.UBCC,BYTE,J/T119L8 ; SEE IF TIME TO CHECK FOR INVALID BYTES
U 1307, 0000,003C,0180,0800,0000,1309            J/T119S4                        ; GO TO NEXT SUB TEST
U 13E3, 0000,1B3C,0180,0800,0000,1027    T119L8: ALU.N?                          ; BRANCH IF TIME FOR INVALID BYTES
U 1027, 0000,003C,0180,0A10,0000,13E0    =0111   LAB_R[2],J/T119L7               ; KEEP CHECKING VALID BYTES
U 102F, 0000,003C,0180,0A18,0000,13E0            LAB_R[3],J/T119L7               ; CHECK INVALID BYTES

                                         ;/////////////////////////////////////////////////////////////////////////
                                         ;+
                                         ; IBA=1 AND TWO MEMORY READS
                                         ;-

U 1308, 0000,003D,0180,0800,0000,134F    =0      SUBTEST
U 1309, 0800,003C,0180,0A08,0000,13E4    T119S4: D_R[1]
```

```
U 13E4, 0019,0000,0580,0A88,0000,130A   ;3357            R[1]_D-K[.1]                     ; SET IBA EQUAL TO 1
                                        ;3358
                                        ;3359
U 130A, 0000,003D,0180,0800,0000,1335   ;3360   =0       ERLOOP
U 130B, 0018,0038,0180,09E0,0000,130C   ;3361            RC[0C]_K[.8]                     ; SET THE BYTE LOOP COUNT
U 130C, 2000,003D,0180,0A08,4200,136C   ;3362   =0       ALU_R[1],FLUSH.IB,CALL,J/IBTWICE ; LOAD THE IB
U 130D, 0000,003C,0180,0A10,0000,13E5   ;3363            LAB_R[2]                         ; GET ADR OF VALID DATA
U 13E5, 0800,003C,0180,09F0,0000,130E   ;3364   T119L9:  RC[0E]_LA,D_LA                   ; SAVE
U 130E, 0000,003D,0180,0800,0000,1363   ;3365   =0       CALL,J7DISPAT                    ; CHECK BYTE 0
U 130F, 001D,A000,0180,0800,0010,13E6   ;3366            ALU_Q-D,CLK.UBCC,BYTE            ; ADR OK?
U 13E6, 0810,0138,0180,0960,0000,1310   ;3367            Z?,D_RC[0C]                      ; BRANCH IF YES
U 1310, 0001,A03D,0180,09E8,0000,1336   ;3368   =0       ERROR1,RC[0D]_Q,BYTE             ;
U 1311, 0819,8000,0580,09E0,0010,13E7   ;3369            RC[0C]_D-K[.1],CLK.UBCC,BYTE,D_ALU ; DECREMENT LOOP COUNT
U 13E7, C000,013C,0180,0800,0000,1312   ;3370            Z?,IBC7CLR.0                     ; BRANCH IF DONE
U 1312, 0019,8000,0980,0800,0010,13E8   ;3371   =0       ALU_D-K[.2],CLK.UBCC,BYTE,J/T119L10 ; SEE IF TIME TO CHECK FOR INVALID BYTES
U 1313, 0000,003C,0180,0800,0000,1315   ;3372            J/T119S5                         ; GO TO NEXT SUB TEST
U 13E8, 0000,1B3C,0180,0800,0000,1037   ;3373   T119L10:ALU.N?                            ; BRANCH IF TIME FOR INVALID BYTES
U 1037, 0000,003C,0180,0A10,0000,13E5   ;3374   =0111    LAB_R[2],J/T119L9                ; KEEP CHECKING VALID BYTES
U 103F, 0000,003C,0180,0A18,0000,13E5   ;3375            LAB_R[3],J/T119L9                ; CHECK INVALID BYTES
                                        ;3376
                                        ;3377
                                        ;3378   ;//////////////////////////////////////////////////////////////////////////
                                        ;3379   ;+
                                        ;3380   ; IBA=3 AND THREE MEMORY REFERANCES
                                        ;3381   ;-
                                        ;3382
U 1314, 0000,003D,0180,0800,0000,134F   ;3383   =0       SUBTEST
U 1315, 0800,003C,0180,0A08,0000,13E9   ;3384   T119S5:  D_R[1]
U 13E9, 0019,0014,0980,0A88,0000,1316   ;3385            R[1]_D+K[.2]                     ; SET IBA EQUAL TO 3
                                        ;3386
                                        ;3387
U 1316, 0000,003D,0180,0800,0000,1335   ;3388   =0       ERLOOP
U 1317, 0018,0038,0180,09E0,0000,1318   ;3389            RC[0C]_K[.8]                     ; SET THE BYTE LOOP COUNT
U 1318, 2000,003D,0180,0A08,4200,1364   ;3390   =0       ALU_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE IB
U 1319, 0000,003C,0180,0A10,0000,13EA   ;3391            LAB_R[2]                         ; GET ADR OF VALID DATA
U 13EA, 0800,003C,0180,09F0,0000,131A   ;3392   T119L11:RC[0E]_LA,D_LA                    ; SAVE
U 131A, 0000,003D,0180,0800,0000,1363   ;3393   =0       CALL,J7DISPAT                    ; CHECK BYTE 0
U 131B, 001D,A000,0180,0800,0010,13EB   ;3394            ALU_Q-D,CLK.UBCC,BYTE            ; ADR OK?
U 13EB, 0810,0138,0180,0960,0000,131C   ;3395            Z?,D_RC[0C]                      ; BRANCH IF YES
U 131C, 0001,A03D,0180,09E8,0000,1336   ;3396   =0       ERROR1,RC[0D]_Q,BYTE             ;
U 131D, 0819,8000,0580,09E0,0010,13EC   ;3397            RC[0C]_D-K[.1],CLK.UBCC,BYTE,D_ALU ; DECREMENT LOOP COUNT
U 13EC, C000,013C,0180,0800,0000,131E   ;3398            Z?,IBC7CLR.0                     ; BRANCH IF DONE
U 131E, 0000,003C,0180,0A10,0000,13EA   ;3399   =0       LAB_R[2],J/T119L11               ; CONTINUE TESTING
U 131F, 0000,003C,0180,0800,0000,13ED   ;3400            NOP
                                        ;3401
                                        ;3402
U 13ED, 0000,003C,0180,0800,0000,1320   ;3403            NOP
                                        ;3404
                                        ;3405
                                        ;3406
                                        ;3407
                                        ;3408   ; THE FOLLOWING DATA IS USED IN THE ABOVE TEST:
                                        ;3409   ;% 14
                                        ;3410   ;$ 0000,0000,0000,0000,0000,0000
                                        ;3411
```

```
                                            ;3412
                                            ;3413
                                            ;3414   =0
U 1320, 0000,003D,0180,0800,0000,105F       ;3415   T11A:    NEWTST
U 1321, 0000,003C,0180,0800,0000,1322       ;3416            NOP
                                            ;3417   =0
U 1322, 0000,003D,0180,0800,0000,105F       ;3418   T11B:    NEWTST
U 1323, 0000,003C,0180,0800,0000,13EE       ;3419            NOP
U 13EE, 0000,003D,0180,0800,0000,105F       ;3420   ENDTST:  NEWTST
```

```
;                          Location / Line Number Index

;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000           1876:    1845     1847=    1866=    1867=    1868=    1846     3279=
U 1008           1884=    1885=    2426=    2427=    2429=    2430=    1869     3280=
U 1010           2431=    2432=    2440=    2441=    2442=    2443=    1870     3321=
U 1018           2445=    2446=    2447=    2448=    2450=    2451=    1871     3322=
U 1020           2453=    2454=    2455=    2456=    2458=    2466=    1872     3347=
U 1028           2467=    2468=    2470=    2471=    2474=    2475=    1873     3348=
U 1030           2476=    2477=    2479=    2480=    2482=    2483=    1874     3374=
U 1038           2484=    2485=    2487=    2495=    2496=    2497=    1875     3375=
U 1040           2499=    2500=    2503=    2504=    2505=    2506=    2508=    2509=
U 1048           2511=    2512=    2513=    2514=    2516=    2524=    1920:    1882
U 1050           2525=    2526=    2527=    2528=    2531=    2532=    2533=    2534=
U 1058           2535=    2536=    1924:    1883     2538=    2539=    1928:    1897
U 1060           2540=    2541=    2543=    2551=    2552=    2553=    2555=    2556=
U 1068           2559=    2560=    2561=    2562=    2563=    2564=    2566=    2567=
U 1070           2568=    2569=    2571=    2579=    2580=    2581=    2583=    2584=
U 1078           2587=    2588=    2589=    2590=    2591=    2592=    2594=    2595=
U 1080           2596=    2597=    2599=    2607=    2608=    2609=    2611=    2612=
U 1088           2616=    2617=    2618=    2619=    2620=    2621=    2623=    2624=
U 1090           2625=    2626=    2628=    2636=    2637=    2638=    2639=    2640=
U 1098           2643=    2644=    2645=    2646=    2647=    2648=    2650=    2651=
U 10A0           2652=    2653=    2655=    2663=    2664=    2665=    2667=    2668=
U 10A8           2671=    2672=    2673=    2674=    2676=    2677=    2679=    2680=
U 10B0           2681=    2682=    2684=    2692=    2693=    2694=    2696=    2697=
U 10B8           2700=    2701=    2702=    2703=    2704=    2705=    2707=    2708=
U 10C0           2709=    2710=    2712=    2720=    2721=    2722=    2724=    2725=
U 10C8           2728=    2729=    2730=    2731=    2732=    2733=    2735=    2736=
U 10D0           2737=    2738=    2740=    2748=    2749=    2750=    2751=    2752=
U 10D8           2755=    2756=    2757=    2758=    2760=    2761=    2763=    2764=
U 10E0           2765=    2766=    2768=    2776=    2777=    2778=    2780=    2781=
U 10E8           2784=    2785=    2786=    2787=    2789=    2790=    2792=    2793=
U 10F0           2794=    2795=    2797=    2805=    2806=    2807=    2809=    2810=
U 10F8           2813=    2814=    2815=    2816=    2818=    2819=    2821=    2822=
U 1100           1831:    1832:    1833:    1834:    1835:    1836:    1837:    1838:
U 1108           1839:    1898     2823=    2824=    1840:    1841:    1842:    1843:
U 1110           2826=    2834=    2835=    2836=    2838=    2839=    2842=    2843=
U 1118           2844=    2845=    2847=    2848=    2850=    2851=    2852=    2853=
U 1120           2855=    2863=    2864=    2865=    2866=    2867=    2870=    2871=
U 1128           2872=    2873=    2874=    2875=    2877=    2878=    2879=    2880=
U 1130           2882=    2890=    2891=    2892=    2894=    2895=    2898=    2899=
U 1138           2900=    2901=    2904=    2905=    2907=    2908=    2909=    2910=
U 1140           2912=    2920=    2921=    2922=    2924=    2925=    2928=    2929=
U 1148           2930=    2931=    2932=    2933=    2935=    2936=    2937=    2938=
U 1150           2940=    2948=    2949=    2950=    1899     2010:    2952=    2953=
U 1158           2955=    2956=    2959=    2960=    2961=    2962=    2963=    2964=
U 1160           2966=    2967=    2968=    2969=    2971=    2972=    2981=    2982=
U 1168           2983=    2984=    2986=    2987=    2990=    2991=    2992=    2993=
U 1170           2995=    2996=    2998=    2999=    3000=    3001=    3003=    3011=
U 1178           3012=    3013=    3015=    3016=    3019=    3020=    3021=    3022=
U 1180           3024=    3025=    3027=    3028=    3029=    3030=    3032=    3040=
U 1188           3041=    3042=    3044=    3045=    3048=    3049=    3050=    3051=
U 1190           3053=    3054=    3056=    3057=    3058=    3059=    3061=    3069=
U 1198           3070=    3071=    3075=    3076=    3079=    3080=    3081=    3082=
;Location       0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0          3084=   3085=   3087=   3088=   3089=   3090=   3092=   3100=
U 11A8          3101=   3102=   3104=   3105=   3108=   3109=   3110=   3111=
U 11B0          3113=   3114=   3116=   3117=   3118=   3119=   3121=   3129=
U 11B8          3130=   3131=   3133=   3134=   3137=   3138=   3139=   3140=
U 11C0          3143=   3144=   3146=   3147=   3148=   3149=   3151=   3159=
U 11C8          3160=   3161=   3165=   3166=   3169=   3170=   3171=   3172=
U 11D0          3174=   3175=   3177=   3178=   3179=   3180=   3182=   3183=
U 11D8          3243=   3244=   3247=   3248=   3249=   3250=   3259=   3260=
U 11E0          3261=   3262=   3265=   3266=   3268=   3269=   3271=   3277=
U 11E8          3284=   3285=   3289=   3290=   3293=   3301=   3302=   3303=
U 11F0          3305=   3306=   3307=   3308=   3309=   3310=   3312=   3313=
U 11F8          3315=   3316=   3318=   3319=   3330=   3331=   3333=   3334=
U 1200          2053:   2054:   2055:   2056:   2057:   2058:   2059:   2060:
U 1208          2061:   2062:   2063:   2064:   2065:   2066:   2067:   2068:
U 1210          2069:   2070:   2071:   2072:   2073:   2074:   2075:   2076:
U 1218          2077:   2078:   2079:   2080:   2081:   2082:   2083:   2084:
U 1220          2085:   2086:   2087:   2088:   2089:   2090:   2091:   2092:
U 1228          2093:   2094:   2095:   2096:   2097:   2098:   2099:   2100:
U 1230          2101:   2102:   2103:   2104:   2105:   2106:   2107:   2108:
U 1238          2109:   2110:   2111:   2112:   2113:   2114:   2115:   2116:
U 1240          2117:   2118:   2119:   2120:   2121:   2122:   2123:   2124:
U 1248          2125:   2126:   2127:   2128:   2129:   2130:   2131:   2132:
U 1250          2133:   2134:   2135:   2136:   2137:   2138:   2139:   2140:
U 1258          2141:   2142:   2143:   2144:   2145:   2146:   2147:   2148:
U 1260          2149:   2150:   2151:   2152:   2153:   2154:   2155:   2156:
U 1268          2157:   2158:   2159:   2160:   2161:   2162:   2163:   2164:
U 1270          2165:   2166:   2167:   2168:   2169:   2170:   2171:   2172:
U 1278          2173:   2174:   2175:   2176:   2177:   2178:   2179:   2180:
U 1280          2181:   2182:   2183:   2184:   2185:   2186:   2187:   2188:
U 1288          2189:   2190:   2191:   2192:   2193:   2194:   2195:   2196:
U 1290          2197:   2198:   2199:   2200:   2201:   2202:   2203:   2204:
U 1298          2205:   2206:   2207:   2208:   2209:   2210:   2211:   2212:
U 12A0          2213:   2214:   2215:   2216:   2217:   2218:   2219:   2220:
U 12A8          2221:   2222:   2223:   2224:   2225:   2226:   2227:   2228:
U 12B0          2229:   2230:   2231:   2232:   2233:   2234:   2235:   2236:
U 12B8          2237:   2238:   2239:   2240:   2241:   2242:   2243:   2244:
U 12C0          2245:   2246:   2247:   2248:   2249:   2250:   2251:   2252:
U 12C8          2253:   2254:   2255:   2256:   2257:   2258:   2259:   2260:
U 12D0          2261:   2262:   2263:   2264:   2265:   2266:   2267:   2268:
U 12D8          2269:   2270:   2271:   2272:   2273:   2274:   2275:   2276:
U 12E0          2277:   2278:   2279:   2280:   2281:   2282:   2283:   2284:
U 12E8          2285:   2286:   2287:   2288:   2289:   2290:   2291:   2292:
U 12F0          2293:   2294:   2295:   2296:   2297:   2298:   2299:   2300:
U 12F8          2301:   2302:   2303:   2304:   2305:   2306:   2307:   2308:
U 1300          3335=   3336=   3338=   3339=   3341=   3342=   3344=   3345=
U 1308          3355=   3356=   3360=   3361=   3362=   3363=   3365=   3366=
U 1310          3368=   3369=   3371=   3372=   3383=   3384=   3388=   3389=
U 1318          3390=   3391=   3393=   3394=   3396=   3397=   3399=   3400=
U 1320          3415=   3416=   3418=   3419=   1900    1901    1902    1903
U 1328          1904    1905    1906    1907    1908    1909    1910    1911
U 1330          1912    1913    1914    1915    1916    1917    1918    1919
U 1338          1922    1923    1966    1967    1968    1969    1970    1971
U 1340          1972    1973    1974    1975    1976    1977    1978    1979
```

```
;Location       0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348          1980    1981    1983    1984    1985    1986    1988    1998
U 1350          1999    2007    2008    2009    2018    2019    2021    2022
U 1358          2023    2024    2027    2028    2029    2030    2031    2032
U 1360          2033    2034    2035    2048    2316    2317    2318    2320
U 1368          2321    2323    2324    2332    2341    2428    2452    2457
U 1370          2469    2481    2486    2498    2510    2515    2537    2542
U 1378          2554    2565    2570    2582    2593    2598    2610    2613
U 1380          2622    2627    2649    2654    2666    2675    2678    2683
U 1388          2695    2706    2711    2723    2734    2739    2759    2762
U 1390          2767    2779    2788    2791    2796    2808    2817    2820
U 1398          2825    2837    2846    2849    2854    2876    2881    2893
U 13A0          2902    2903    2906    2911    2923    2934    2939    2951
U 13A8          2954    2965    2970    2985    2994    2997    3002    3014
U 13B0          3023    3026    3031    3043    3052    3055    3060    3072
U 13B8          3073    3074    3083    3086    3091    3103    3112    3115
U 13C0          3120    3132    3141    3142    3145    3150    3162    3163
U 13C8          3164    3173    3176    3181    3245    3246    3263    3264
U 13D0          3267    3270    3278    3281    3282    3286    3287    3288
U 13D8          3291    3292    3304    3311    3314    3317    3320    3332
U 13E0          3337    3340    3343    3346    3357    3364    3367    3370
U 13E8          3373    3385    3392    3395    3398    3403    3420
U 13F0          1934:   1935:   1936:   1937:   1938:   1939:   1940:   1941:
U 13F8          1942:   1943:   1944:   1945:   1946:   1947:   1948:   1949:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH34       1023

Used            1023
Remaining

Total microwords used in memory U: 1023
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH34.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 2306  TEST 11C        VALID BIT GENERATION (CONTINUED)
; 2398  TEST 11D        STALL CONTROL LOGIC
; 2637  TEST 11E        'A FORK' OP CODE DECODE
; 2796  TEST 11F        'A FORK' BRANCH OPCODES DECODE
; 3028  TEST 120        SELECT SPECIFIER LOGIC
; 3222  TEST 121        'B FORK' OPCODE DECODES
; 3364  TEST 122        'C FORK' OPCODE DECODES
; 3523  TEST 123        D MUX SELECT AND DATA INTEGRITY
; 3870  TEST 124        BDEST AND 16 BIT BDEST DECODE
```

```
;1        .NOLIST
;1804     .LIST
;1805
```

```
                                          .REGION/1000,13FF

                                          ;+
                                          ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                          ; WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
                                          ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                          ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                          ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                          ;
                                          ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                          ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                          ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                          ;       R[OF] AND DO A RETURN0.
                                          ;
                                          ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                          ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                          ; TO THE CONSOLE.
                                          ;
                                          ; THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
                                          ; ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURN0 IF THE TRAP WAS
                                          ; EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
                                          ; RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
                                          ; STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.
                                          ;-

U 1100, 0000,003C,19C0,0A78,0084,7001     1100:   SC_K[ZERO],Q_R[OF],J/TRPH0      ; SYSTEM INIT
U 1101, 0000,003C,05C0,0A78,0084,7001     1101:   SC_K[.1],Q_R[OF],J/TRPH0        ; DATA UNALIGNED
U 1102, 0000,003C,09C0,0A78,0084,7001     1102:   SC_K[.2],Q_R[OF],J/TRPH0        ; X PAGE ERROR
U 1103, 0000,003C,0DC0,0A78,0084,7001     1103:   SC_K[.3],Q_R[OF],J/TRPH0        ; TB MODIFY
U 1104, 0000,003C,11C0,0A78,0084,7001     1104:   SC_K[.4],Q_R[OF],J/TRPH0        ; TB PROT ERROR
U 1105, 0000,003C,D5C0,0A78,0084,7001     1105:   SC_K[.6],Q_R[OF],J/TRPH0        ; TB MISS
U 1106, 0000,003C,D9C0,0A78,0084,7001     1106:   SC_K[.9],Q_R[OF],J/TRPH0        ; RES FLOAT OPER
U 1107, 0000,003C,5DC0,0A78,0084,7001     1107:   SC_K[.7],Q_R[OF],J/TRPH0        ; TB PARITY
U 1108, 0000,003C,01C0,0A78,0084,7001     1108:   SC_K[.8],Q_R[OF],J/TRPH0        ; CACHE PARITY
U 110C, 0000,003C,85C0,0A78,0084,7001     110C:   SC_K[.C],Q_R[OF],J/TRPH0        ; RDS
U 110D, 0000,003C,89C0,0A78,0084,7001     110D:   SC_K[.D],Q_R[OF],J/TRPH0        ; TIME OUT
U 110E, 0000,003C,65C0,0A78,0084,7001     110E:   SC_K[.10],Q_R[OF],J/TRPH0       ; ODD ADDRESS
U 110F, 0000,003C,61C0,0A78,0084,718F     110F:   SC_K[.F],Q_R[OF],J/TRPH2        ; CS PARITY

U 1001, 0001,2024,0180,0800,0010,104F     TRPH0:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 104F, 0000,013C,0180,0800,0000,1002             Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000     =0      ALU_Q[AND]MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN


                                          ;+
                                          ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                          ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                          ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                          ;
                                          ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                          ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                          ;             FAULT STATUS REGISTER
                                          ;             SBI ERROR REGISTER
                                          ;             TIMEOUT ADDRESS REGISTER
                                          ;             MAINTENANCE REGISTER
                                          ;1861   :              CACHE PARITY REGISTER
                                          ;1862   :              TB ERROR REGISTER 1
                                          ;1863   :              TB ERROR REGISTER 0
                                          ;1864   :-
                                          ;1865
U 1003, 0018,0038,1D80,09E8,0000,1004     ;1866   TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,71C1     ;1867   =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,105B     ;1868           Q_ID[TBER0]
U 105B, 0001,203C,4DF0,2DB0,0000,105F     ;1869           RC[6]_Q,Q_ID[TBER1]
U 105F, 0001,203C,65F0,2DB8,0000,1109     ;1870           RC[7]_Q,Q_ID[SBI.ERR]
U 1109, 0001,203C,6DF0,2DD8,0000,1154     ;1871           RC[0B]_Q,Q_ID[FAULT]
U 1154, 0001,203C,75F0,2DE0,0000,118C     ;1872           RC[0C]_Q,Q_ID[MAINT]
U 118C, 0001,203C,79F0,2DC8,0000,118D     ;1873           RC[9]_Q,Q_ID[PARITY]
U 118D, 0001,203C,69F0,2DC0,0000,118E     ;1874           RC[8]_Q,Q_ID[TIME.ADDR]
U 118E, 0001,203C,81F0,2DD0,0000,1000     ;1875           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,11A6     ;1876   1000:   RC[0E]_Q,ERROR1
                                          ;1877
                                          ;1878   ;+
                                          ;1879   ; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
                                          ;1880   ;-
                                          ;1881
U 118F, 0001,2024,0180,0800,0010,1190     ;1882   TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS THE TRAP EXPECTED?
U 1190, 0000,013C,0180,0800,0000,1006     ;1883           Z?                              ; BRANCH IF NO
U 1006, 0001,2036,0180,0AF8,0000,0001     ;1884   =0      ALU_Q[AND]MASK,R[0F]_ALU,RETURN1 ; RETURN
U 1007, 0000,003C,0180,0800,0000,1003     ;1885           J/TRPH1                         ; REPORT UNEXPECTED TRAP
                                          ;1886
                                          ;1887
                                          ;1888   ;+
                                          ;1889   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                          ;1890   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                          ;1891   ;                 NEWTST
                                          ;1892   ;                 ERLOOP
                                          ;1893   ;                 ERROR1
                                          ;1894   ;                 ERROR2
                                          ;1895   ;
                                          ;1896
U 1191, 0000,003C,65F8,0800,0084,7192     ;1897   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 1192, 0818,0038,8D80,0800,0000,1193     ;1898           D_K[.1F]                        ; ...
U 1193, 0D00,003C,0180,0800,0000,1194     ;1899           D_DAL.SC
U 1194, 0000,003C,3D80,3C00,0000,1195     ;1900           ID[PSL]_D                       ; WRITE THE PSL
U 1195, 0818,0038,0580,0800,0000,1196     ;1901           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 1196, 0D00,003C,0180,0800,0000,1197     ;1902           D_DAL.SC
U 1197, 0F00,003C,3180,3C00,0000,1198     ;1903           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 1198, 0000,003C,5D80,3C00,0000,1199     ;1904           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 1199, 0000,003C,3980,3C00,0000,119A     ;1905           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 119A, 0000,003C,2980,3C00,0000,119B     ;1906           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 119B, 0000,003C,4980,3C00,0000,119C     ;1907           ID[TBER0]_D                     ; SHUT OFF THE TB
U 119C, 0000,003C,7180,3C00,0000,119D     ;1908           ID[COMP]_D                      ; CLEAR SILO COMPARATOR
U 119D, 0818,0038,C180,0800,0000,119E     ;1909           D_K[.FFFF]
U 119E, 0000,003C,6580,3C00,0000,119F     ;1910           ID[SBI.ERR]_D
U 119F, 0F00,003C,6D80,3C00,0000,11A0     ;1911           ID[FAULT]_D,D_0
U 11A0, 0000,003C,6D80,3C00,0000,11A1     ;1912           ID[FAULT]_D
U 11A1, 0000,003C,6580,3C00,0000,11A2     ;1913           ID[SBI.ERR]_D
U 11A2, 0003,003C,0180,09F0,0000,11A3     ;1914           RC[0E]_0
U 11A3, 0003,003C,0180,0AF8,0000,11A4     ;1915           R[0F]_0
```

```
U 11A4, 0003,003C,0180,09E8,0000,105E   ;1916           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 11A5, 0818,0038,0980,0800,0000,105E   ;1917   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 11A6, 0810,0038,0180,0978,0000,11A7   ;1918   ERROR1: D_RC[0F]
U 11A7, 0819,0034,4D80,0800,0000,104E   ;1919           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1920   104E:   D_D.OR.K[.4],J/CALLCON
                                        ;1921
U 11A8, 0810,0038,0180,0978,0000,11A9   ;1922   ERROR2: D_RC[0F]
U 11A9, 0819,0034,4D80,0800,0000,105A   ;1923           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1924   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1925
                                        ;1926   105E:
                                        ;1927   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1928           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1929
                                        ;1930   ;+
                                        ;1931   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1932   ;-
                                        ;1933
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1934   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1935   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1936   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1937   13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1938   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1939   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1940   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1941   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1942   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1943   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1944   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1945   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1946   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1947   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1948   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,11AA   ;1949   13FF:   NOP
                                        ;1950
                                        ;1951
                                        ;1952   ;+
                                        ;1953   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
                                        ;1954   ; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
                                        ;1955   ; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
                                        ;1956   ; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
                                        ;1957   ;
                                        ;1958   ; FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
                                        ;1959   ;       THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
                                        ;1960   ;
                                        ;1961   ;               =0      D_0,CALL,J/DC5
                                        ;1962   ;                       NOP
                                        ;1963   ;               =0      CALL,J/DC5
                                        ;1964   ;-
                                        ;1965
U 11AA, 0018,0038,1980,0800,0000,11BA   ;1966   DC0:    ALU_0(K),J/S00
U 11AB, 0018,0038,1980,0800,0000,11BB   ;1967   DC1:    ALU_0(K),J/S01
U 11AC, 0018,0038,1980,0800,0000,11BC   ;1968   DC2:    ALU_0(K),J/S10
U 11AD, 0018,0038,1980,0800,0000,11BD   ;1969   DC3:    ALU_0(K),J/S11
U 11AE, 0018,0038,0980,0800,0000,11BA   ;1970   DC4:    ALU_K[.2],J/S00
```

```
U 11AF, 0018,0038,0980,0800,0000,11BB   ;1971   DC5:    ALU_K[.2],J/S01
U 11B0, 0018,0038,0980,0800,0000,11BC   ;1972   DC6:    ALU_K[.2],J/S10
U 11B1, 0018,0038,0980,0800,0000,11BD   ;1973   DC7:    ALU_K[.2],J/S11
U 11B2, 0018,0038,0580,0800,0000,11BA   ;1974   DC8:    ALU_K[.1],J/S00
U 11B3, 0018,0038,0580,0800,0000,11BB   ;1975   DC9:    ALU_K[.1],J/S01
U 11B4, 0018,0038,0580,0800,0000,11BC   ;1976   DCA:    ALU_K[.1],J/S10
U 11B5, 0018,0038,0580,0800,0000,11BD   ;1977   DCB:    ALU_K[.1],J/S11
U 11B6, 0018,0038,C180,0800,0000,11BA   ;1978   DCC:    ALU_K[.FFFF],J/S00
U 11B7, 0018,0038,C180,0800,0000,11BB   ;1979   DCD:    ALU_K[.FFFF],J/S01
U 11B8, 0018,0038,C180,0800,0000,11BC   ;1980   DCE:    ALU_K[.FFFF],J/S10
U 11B9, 0018,0038,C180,0800,0000,11BD   ;1981   DCF:    ALU_K[.FFFF],J/S11
                                        ;1982
U 11BA, 0118,0038,1B80,0800,0000,11BE   ;1983   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 11BB, 0118,0038,0B80,0800,0000,11BE   ;1984   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 11BC, 0118,0038,0780,0800,0000,11BE   ;1985   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 11BD, 0118,0038,C380,0800,0000,11BE   ;1986   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
                                        ;1987
U 11BE, 0100,003E,0380,0800,0000,0001   ;1988   SX:     D_D.LEFT2,SI/7,RETURN1          ; EXIT
                                        ;1989
                                        ;1990
                                        ;1991   ;+
                                        ;1992   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1993   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1994   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1995   ; TYPING IT.
                                        ;1996   ;-
                                        ;1997
U 11BF, 0810,0038,4D80,0978,0000,11C0   ;1998   SUBTST: D_RC[OF],KMX/.FF00
U 11C0, 0019,4016,4D80,09F8,0000,0001   ;1999           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;2000
                                        ;2001   ;+
                                        ;2002   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;2003   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;2004   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;2005   ;-
                                        ;2006
U 11C1, 0010,0038,01C0,0978,0000,11C2   ;2007   SETRCF: Q_RC[OF]
U 11C2, 0019,2034,4DC0,0800,0000,11C3   ;2008           Q_Q.AND.K[.FF00]
U 11C3, 0019,2032,1D80,09F8,0000,0001   ;2009           RC[OF]_Q.OR.SC,RETURN1
                                        ;2010
```

```
                                         ;2011
U 1155, 0019,2000,05C0,0800,0000,12AB    ;2012   1155:   Q_Q-K[.1],J/12AB
                                         ;2013   ;+
                                         ;2014   ; THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
                                         ;2015   ; THE INSTRUCTION AT LOCATION "DISPAT" LOADS THE Q REGISTER WITH HEX 100
                                         ;2016   ; AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
                                         ;2017   ; THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
                                         ;2018   ; THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
                                         ;2019   ; THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.
                                         ;2020   ;-
                                         ;2021
                                         ;2022   SYNC00:
U 11C4, 0038,003B,41C0,0800,0000,1200    ;2023   DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/DISPATTBL
                                         ;2024
                                         ;2025
                                         ;2026   1200:
                                         ;2027   DISPATTBL:
U 1200, 0019,2000,05C0,0800,0000,1201    ;2028   1200:   Q_Q-K[.1]
U 1201, 0019,2000,05C0,0800,0000,1202    ;2029   1201:   Q_Q-K[.1]
U 1202, 0019,2000,05C0,0800,0000,1203    ;2030   1202:   Q_Q-K[.1]
U 1203, 0019,2000,05C0,0800,0000,1204    ;2031   1203:   Q_Q-K[.1]
U 1204, 0019,2000,05C0,0800,0000,1205    ;2032   1204:   Q_Q-K[.1]
U 1205, 0019,2000,05C0,0800,0000,1206    ;2033   1205:   Q_Q-K[.1]
U 1206, 0019,2000,05C0,0800,0000,1207    ;2034   1206:   Q_Q-K[.1]
U 1207, 0019,2000,05C0,0800,0000,1208    ;2035   1207:   Q_Q-K[.1]
U 1208, 0019,2000,05C0,0800,0000,1209    ;2036   1208:   Q_Q-K[.1]
U 1209, 0019,2000,05C0,0800,0000,120A    ;2037   1209:   Q_Q-K[.1]
U 120A, 0019,2000,05C0,0800,0000,120B    ;2038   120A:   Q_Q-K[.1]
U 120B, 0019,2000,05C0,0800,0000,120C    ;2039   120B:   Q_Q-K[.1]
U 120C, 0019,2000,05C0,0800,0000,120D    ;2040   120C:   Q_Q-K[.1]
U 120D, 0019,2000,05C0,0800,0000,120E    ;2041   120D:   Q_Q-K[.1]
U 120E, 0019,2000,05C0,0800,0000,120F    ;2042   120E:   Q_Q-K[.1]
U 120F, 0019,2000,05C0,0800,0000,1210    ;2043   120F:   Q_Q-K[.1]
U 1210, 0019,2000,05C0,0800,0000,1211    ;2044   1210:   Q_Q-K[.1]
U 1211, 0019,2000,05C0,0800,0000,1212    ;2045   1211:   Q_Q-K[.1]
U 1212, 0019,2000,05C0,0800,0000,1213    ;2046   1212:   Q_Q-K[.1]
U 1213, 0019,2000,05C0,0800,0000,1214    ;2047   1213:   Q_Q-K[.1]
U 1214, 0019,2000,05C0,0800,0000,1215    ;2048   1214:   Q_Q-K[.1]
U 1215, 0019,2000,05C0,0800,0000,1216    ;2049   1215:   Q_Q-K[.1]
U 1216, 0019,2000,05C0,0800,0000,1217    ;2050   1216:   Q_Q-K[.1]
U 1217, 0019,2000,05C0,0800,0000,1218    ;2051   1217:   Q_Q-K[.1]
U 1218, 0019,2000,05C0,0800,0000,1219    ;2052   1218:   Q_Q-K[.1]
U 1219, 0019,2000,05C0,0800,0000,121A    ;2053   1219:   Q_Q-K[.1]
U 121A, 0019,2000,05C0,0800,0000,121B    ;2054   121A:   Q_Q-K[.1]
U 121B, 0019,2000,05C0,0800,0000,121C    ;2055   121B:   Q_Q-K[.1]
U 121C, 0019,2000,05C0,0800,0000,121D    ;2056   121C:   Q_Q-K[.1]
U 121D, 0019,2000,05C0,0800,0000,121E    ;2057   121D:   Q_Q-K[.1]
U 121E, 0019,2000,05C0,0800,0000,121F    ;2058   121E:   Q_Q-K[.1]
U 121F, 0019,2000,05C0,0800,0000,1220    ;2059   121F:   Q_Q-K[.1]
U 1220, 0019,2000,05C0,0800,0000,1221    ;2060   1220:   Q_Q-K[.1]
U 1221, 0019,2000,05C0,0800,0000,1222    ;2061   1221:   Q_Q-K[.1]
U 1222, 0019,2000,05C0,0800,0000,1223    ;2062   1222:   Q_Q-K[.1]
U 1223, 0019,2000,05C0,0800,0000,1224    ;2063   1223:   Q_Q-K[.1]
U 1224, 0019,2000,05C0,0800,0000,1225    ;2064   1224:   Q_Q-K[.1]
U 1225, 0019,2000,05C0,0800,0000,1226    ;2065   1225:   Q_Q-K[.1]
```

```
U 1226, 0019,2000,05C0,0800,0000,1227   ;2066    1226:    Q_Q-K[.1]
U 1227, 0019,2000,05C0,0800,0000,1228   ;2067    1227:    Q_Q-K[.1]
U 1228, 0019,2000,05C0,0800,0000,1229   ;2068    1228:    Q_Q-K[.1]
U 1229, 0019,2000,05C0,0800,0000,122A   ;2069    1229:    Q_Q-K[.1]
U 122A, 0019,2000,05C0,0800,0000,122B   ;2070    122A:    Q_Q-K[.1]
U 122B, 0019,2000,05C0,0800,0000,122C   ;2071    122B:    Q_Q-K[.1]
U 122C, 0019,2000,05C0,0800,0000,122D   ;2072    122C:    Q_Q-K[.1]
U 122D, 0019,2000,05C0,0800,0000,122E   ;2073    122D:    Q_Q-K[.1]
U 122E, 0019,2000,05C0,0800,0000,122F   ;2074    122E:    Q_Q-K[.1]
U 122F, 0019,2000,05C0,0800,0000,1230   ;2075    122F:    Q_Q-K[.1]
U 1230, 0019,2000,05C0,0800,0000,1231   ;2076    1230:    Q_Q-K[.1]
U 1231, 0019,2000,05C0,0800,0000,1232   ;2077    1231:    Q_Q-K[.1]
U 1232, 0019,2000,05C0,0800,0000,1233   ;2078    1232:    Q_Q-K[.1]
U 1233, 0019,2000,05C0,0800,0000,1234   ;2079    1233:    Q_Q-K[.1]
U 1234, 0019,2000,05C0,0800,0000,1235   ;2080    1234:    Q_Q-K[.1]
U 1235, 0019,2000,05C0,0800,0000,1236   ;2081    1235:    Q_Q-K[.1]
U 1236, 0019,2000,05C0,0800,0000,1237   ;2082    1236:    Q_Q-K[.1]
U 1237, 0019,2000,05C0,0800,0000,1238   ;2083    1237:    Q_Q-K[.1]
U 1238, 0019,2000,05C0,0800,0000,1239   ;2084    1238:    Q_Q-K[.1]
U 1239, 0019,2000,05C0,0800,0000,123A   ;2085    1239:    Q_Q-K[.1]
U 123A, 0019,2000,05C0,0800,0000,123B   ;2086    123A:    Q_Q-K[.1]
U 123B, 0019,2000,05C0,0800,0000,123C   ;2087    123B:    Q_Q-K[.1]
U 123C, 0019,2000,05C0,0800,0000,123D   ;2088    123C:    Q_Q-K[.1]
U 123D, 0019,2000,05C0,0800,0000,123E   ;2089    123D:    Q_Q-K[.1]
U 123E, 0019,2000,05C0,0800,0000,123F   ;2090    123E:    Q_Q-K[.1]
U 123F, 0019,2000,05C0,0800,0000,1240   ;2091    123F:    Q_Q-K[.1]
U 1240, 0019,2000,05C0,0800,0000,1241   ;2092    1240:    Q_Q-K[.1]
U 1241, 0019,2000,05C0,0800,0000,1242   ;2093    1241:    Q_Q-K[.1]
U 1242, 0019,2000,05C0,0800,0000,1243   ;2094    1242:    Q_Q-K[.1]
U 1243, 0019,2000,05C0,0800,0000,1244   ;2095    1243:    Q_Q-K[.1]
U 1244, 0019,2000,05C0,0800,0000,1245   ;2096    1244:    Q_Q-K[.1]
U 1245, 0019,2000,05C0,0800,0000,1246   ;2097    1245:    Q_Q-K[.1]
U 1246, 0019,2000,05C0,0800,0000,1247   ;2098    1246:    Q_Q-K[.1]
U 1247, 0019,2000,05C0,0800,0000,1248   ;2099    1247:    Q_Q-K[.1]
U 1248, 0019,2000,05C0,0800,0000,1249   ;2100    1248:    Q_Q-K[.1]
U 1249, 0019,2000,05C0,0800,0000,124A   ;2101    1249:    Q_Q-K[.1]
U 124A, 0019,2000,05C0,0800,0000,124B   ;2102    124A:    Q_Q-K[.1]
U 124B, 0019,2000,05C0,0800,0000,124C   ;2103    124B:    Q_Q-K[.1]
U 124C, 0019,2000,05C0,0800,0000,124D   ;2104    124C:    Q_Q-K[.1]
U 124D, 0019,2000,05C0,0800,0000,124E   ;2105    124D:    Q_Q-K[.1]
U 124E, 0019,2000,05C0,0800,0000,124F   ;2106    124E:    Q_Q-K[.1]
U 124F, 0019,2000,05C0,0800,0000,1250   ;2107    124F:    Q_Q-K[.1]
U 1250, 0019,2000,05C0,0800,0000,1251   ;2108    1250:    Q_Q-K[.1]
U 1251, 0019,2000,05C0,0800,0000,1252   ;2109    1251:    Q_Q-K[.1]
U 1252, 0019,2000,05C0,0800,0000,1253   ;2110    1252:    Q_Q-K[.1]
U 1253, 0019,2000,05C0,0800,0000,1254   ;2111    1253:    Q_Q-K[.1]
U 1254, 0019,2000,05C0,0800,0000,1255   ;2112    1254:    Q_Q-K[.1]
U 1255, 0019,2000,05C0,0800,0000,1256   ;2113    1255:    Q_Q-K[.1]
U 1256, 0019,2000,05C0,0800,0000,1257   ;2114    1256:    Q_Q-K[.1]
U 1257, 0019,2000,05C0,0800,0000,1258   ;2115    1257:    Q_Q-K[.1]
U 1258, 0019,2000,05C0,0800,0000,1259   ;2116    1258:    Q_Q-K[.1]
U 1259, 0019,2000,05C0,0800,0000,125A   ;2117    1259:    Q_Q-K[.1]
U 125A, 0019,2000,05C0,0800,0000,125B   ;2118    125A:    Q_Q-K[.1]
U 125B, 0019,2000,05C0,0800,0000,125C   ;2119    125B:    Q_Q-K[.1]
U 125C, 0019,2000,05C0,0800,0000,125D   ;2120    125C:    Q_Q-K[.1]
```

```
U 125D, 0019,2000,05C0,0800,0000,125E    ;2121    125D:    Q_Q-K[.1]
U 125E, 0019,2000,05C0,0800,0000,125F    ;2122    125E:    Q_Q-K[.1]
U 125F, 0019,2000,05C0,0800,0000,1260    ;2123    125F:    Q_Q-K[.1]
U 1260, 0019,2000,05C0,0800,0000,1261    ;2124    1260:    Q_Q-K[.1]
U 1261, 0019,2000,05C0,0800,0000,1262    ;2125    1261:    Q_Q-K[.1]
U 1262, 0019,2000,05C0,0800,0000,1263    ;2126    1262:    Q_Q-K[.1]
U 1263, 0019,2000,05C0,0800,0000,1264    ;2127    1263:    Q_Q-K[.1]
U 1264, 0019,2000,05C0,0800,0000,1265    ;2128    1264:    Q_Q-K[.1]
U 1265, 0019,2000,05C0,0800,0000,1266    ;2129    1265:    Q_Q-K[.1]
U 1266, 0019,2000,05C0,0800,0000,1267    ;2130    1266:    Q_Q-K[.1]
U 1267, 0019,2000,05C0,0800,0000,1268    ;2131    1267:    Q_Q-K[.1]
U 1268, 0019,2000,05C0,0800,0000,1269    ;2132    1268:    Q_Q-K[.1]
U 1269, 0019,2000,05C0,0800,0000,126A    ;2133    1269:    Q_Q-K[.1]
U 126A, 0019,2000,05C0,0800,0000,126B    ;2134    126A:    Q_Q-K[.1]
U 126B, 0019,2000,05C0,0800,0000,126C    ;2135    126B:    Q_Q-K[.1]
U 126C, 0019,2000,05C0,0800,0000,126D    ;2136    126C:    Q_Q-K[.1]
U 126D, 0019,2000,05C0,0800,0000,126E    ;2137    126D:    Q_Q-K[.1]
U 126E, 0019,2000,05C0,0800,0000,126F    ;2138    126E:    Q_Q-K[.1]
U 126F, 0019,2000,05C0,0800,0000,1270    ;2139    126F:    Q_Q-K[.1]
U 1270, 0019,2000,05C0,0800,0000,1271    ;2140    1270:    Q_Q-K[.1]
U 1271, 0019,2000,05C0,0800,0000,1272    ;2141    1271:    Q_Q-K[.1]
U 1272, 0019,2000,05C0,0800,0000,1273    ;2142    1272:    Q_Q-K[.1]
U 1273, 0019,2000,05C0,0800,0000,1274    ;2143    1273:    Q_Q-K[.1]
U 1274, 0019,2000,05C0,0800,0000,1275    ;2144    1274:    Q_Q-K[.1]
U 1275, 0019,2000,05C0,0800,0000,1276    ;2145    1275:    Q_Q-K[.1]
U 1276, 0019,2000,05C0,0800,0000,1277    ;2146    1276:    Q_Q-K[.1]
U 1277, 0019,2000,05C0,0800,0000,1278    ;2147    1277:    Q_Q-K[.1]
U 1278, 0019,2000,05C0,0800,0000,1279    ;2148    1278:    Q_Q-K[.1]
U 1279, 0019,2000,05C0,0800,0000,127A    ;2149    1279:    Q_Q-K[.1]
U 127A, 0019,2000,05C0,0800,0000,127B    ;2150    127A:    Q_Q-K[.1]
U 127B, 0019,2000,05C0,0800,0000,127C    ;2151    127B:    Q_Q-K[.1]
U 127C, 0019,2000,05C0,0800,0000,127D    ;2152    127C:    Q_Q-K[.1]
U 127D, 0019,2000,05C0,0800,0000,127E    ;2153    127D:    Q_Q-K[.1]
U 127E, 0019,2000,05C0,0800,0000,127F    ;2154    127E:    Q_Q-K[.1]
U 127F, 0019,2000,05C0,0800,0000,1280    ;2155    127F:    Q_Q-K[.1]
U 1280, 0019,2000,05C0,0800,0000,1281    ;2156    1280:    Q_Q-K[.1]
U 1281, 0019,2000,05C0,0800,0000,1282    ;2157    1281:    Q_Q-K[.1]
U 1282, 0019,2000,05C0,0800,0000,1283    ;2158    1282:    Q_Q-K[.1]
U 1283, 0019,2000,05C0,0800,0000,1284    ;2159    1283:    Q_Q-K[.1]
U 1284, 0019,2000,05C0,0800,0000,1285    ;2160    1284:    Q_Q-K[.1]
U 1285, 0019,2000,05C0,0800,0000,1286    ;2161    1285:    Q_Q-K[.1]
U 1286, 0019,2000,05C0,0800,0000,1287    ;2162    1286:    Q_Q-K[.1]
U 1287, 0019,2000,05C0,0800,0000,1288    ;2163    1287:    Q_Q-K[.1]
U 1288, 0019,2000,05C0,0800,0000,1289    ;2164    1288:    Q_Q-K[.1]
U 1289, 0019,2000,05C0,0800,0000,128A    ;2165    1289:    Q_Q-K[.1]
U 128A, 0019,2000,05C0,0800,0000,128B    ;2166    128A:    Q_Q-K[.1]
U 128B, 0019,2000,05C0,0800,0000,128C    ;2167    128B:    Q_Q-K[.1]
U 128C, 0019,2000,05C0,0800,0000,128D    ;2168    128C:    Q_Q-K[.1]
U 128D, 0019,2000,05C0,0800,0000,128E    ;2169    128D:    Q_Q-K[.1]
U 128E, 0019,2000,05C0,0800,0000,128F    ;2170    128E:    Q_Q-K[.1]
U 128F, 0019,2000,05C0,0800,0000,1290    ;2171    128F:    Q_Q-K[.1]
U 1290, 0019,2000,05C0,0800,0000,1291    ;2172    1290:    Q_Q-K[.1]
U 1291, 0019,2000,05C0,0800,0000,1292    ;2173    1291:    Q_Q-K[.1]
U 1292, 0019,2000,05C0,0800,0000,1293    ;2174    1292:    Q_Q-K[.1]
U 1293, 0019,2000,05C0,0800,0000,1294    ;2175    1293:    Q_Q-K[.1]
```

```
U 1294, 0019,2000,05C0,0800,0000,1295   ;2176   1294:   Q_Q-K[.1]
U 1295, 0019,2000,05C0,0800,0000,1296   ;2177   1295:   Q_Q-K[.1]
U 1296, 0019,2000,05C0,0800,0000,1297   ;2178   1296:   Q_Q-K[.1]
U 1297, 0019,2000,05C0,0800,0000,1298   ;2179   1297:   Q_Q-K[.1]
U 1298, 0019,2000,05C0,0800,0000,1299   ;2180   1298:   Q_Q-K[.1]
U 1299, 0019,2000,05C0,0800,0000,129A   ;2181   1299:   Q_Q-K[.1]
U 129A, 0019,2000,05C0,0800,0000,129B   ;2182   129A:   Q_Q-K[.1]
U 129B, 0019,2000,05C0,0800,0000,129C   ;2183   129B:   Q_Q-K[.1]
U 129C, 0019,2000,05C0,0800,0000,129D   ;2184   129C:   Q_Q-K[.1]
U 129D, 0019,2000,05C0,0800,0000,129E   ;2185   129D:   Q_Q-K[.1]
U 129E, 0019,2000,05C0,0800,0000,129F   ;2186   129E:   Q_Q-K[.1]
U 129F, 0019,2000,05C0,0800,0000,12A0   ;2187   129F:   Q_Q-K[.1]
U 12A0, 0019,2000,05C0,0800,0000,12A1   ;2188   12A0:   Q_Q-K[.1]
U 12A1, 0019,2000,05C0,0800,0000,12A2   ;2189   12A1:   Q_Q-K[.1]
U 12A2, 0019,2000,05C0,0800,0000,12A3   ;2190   12A2:   Q_Q-K[.1]
U 12A3, 0019,2000,05C0,0800,0000,12A4   ;2191   12A3:   Q_Q-K[.1]
U 12A4, 0019,2000,05C0,0800,0000,12A5   ;2192   12A4:   Q_Q-K[.1]
U 12A5, 0019,2000,05C0,0800,0000,12A6   ;2193   12A5:   Q_Q-K[.1]
U 12A6, 0019,2000,05C0,0800,0000,12A7   ;2194   12A6:   Q_Q-K[.1]
U 12A7, 0019,2000,05C0,0800,0000,12A8   ;2195   12A7:   Q_Q-K[.1]
U 12A8, 0019,2000,05C0,0800,0000,12A9   ;2196   12A8:   Q_Q-K[.1]
U 12A9, 0019,2000,05C0,0800,0000,12AA   ;2197   12A9:   Q_Q-K[.1]
U 12AA, 0019,2000,05C0,0800,0000,12AB   ;2198   12AA:   Q_Q-K[.1]
U 12AB, 0019,2000,05C0,0800,0000,12AC   ;2199   12AB:   Q_Q-K[.1]
U 12AC, 0019,2000,05C0,0800,0000,12AD   ;2200   12AC:   Q_Q-K[.1]
U 12AD, 0019,2000,05C0,0800,0000,12AE   ;2201   12AD:   Q_Q-K[.1]
U 12AE, 0019,2000,05C0,0800,0000,12AF   ;2202   12AE:   Q_Q-K[.1]
U 12AF, 0019,2000,05C0,0800,0000,12B0   ;2203   12AF:   Q_Q-K[.1]
U 12B0, 0019,2000,05C0,0800,0000,12B1   ;2204   12B0:   Q_Q-K[.1]
U 12B1, 0019,2000,05C0,0800,0000,12B2   ;2205   12B1:   Q_Q-K[.1]
U 12B2, 0019,2000,05C0,0800,0000,12B3   ;2206   12B2:   Q_Q-K[.1]
U 12B3, 0019,2000,05C0,0800,0000,12B4   ;2207   12B3:   Q_Q-K[.1]
U 12B4, 0019,2000,05C0,0800,0000,12B5   ;2208   12B4:   Q_Q-K[.1]
U 12B5, 0019,2000,05C0,0800,0000,12B6   ;2209   12B5:   Q_Q-K[.1]
U 12B6, 0019,2000,05C0,0800,0000,12B7   ;2210   12B6:   Q_Q-K[.1]
U 12B7, 0019,2000,05C0,0800,0000,12B8   ;2211   12B7:   Q_Q-K[.1]
U 12B8, 0019,2000,05C0,0800,0000,12B9   ;2212   12B8:   Q_Q-K[.1]
U 12B9, 0019,2000,05C0,0800,0000,12BA   ;2213   12B9:   Q_Q-K[.1]
U 12BA, 0019,2000,05C0,0800,0000,12BB   ;2214   12BA:   Q_Q-K[.1]
U 12BB, 0019,2000,05C0,0800,0000,12BC   ;2215   12BB:   Q_Q-K[.1]
U 12BC, 0019,2000,05C0,0800,0000,12BD   ;2216   12BC:   Q_Q-K[.1]
U 12BD, 0019,2000,05C0,0800,0000,12BE   ;2217   12BD:   Q_Q-K[.1]
U 12BE, 0019,2000,05C0,0800,0000,12BF   ;2218   12BE:   Q_Q-K[.1]
U 12BF, 0019,2000,05C0,0800,0000,12C0   ;2219   12BF:   Q_Q-K[.1]
U 12C0, 0019,2000,05C0,0800,0000,12C1   ;2220   12C0:   Q_Q-K[.1]
U 12C1, 0019,2000,05C0,0800,0000,12C2   ;2221   12C1:   Q_Q-K[.1]
U 12C2, 0019,2000,05C0,0800,0000,12C3   ;2222   12C2:   Q_Q-K[.1]
U 12C3, 0019,2000,05C0,0800,0000,12C4   ;2223   12C3:   Q_Q-K[.1]
U 12C4, 0019,2000,05C0,0800,0000,12C5   ;2224   12C4:   Q_Q-K[.1]
U 12C5, 0019,2000,05C0,0800,0000,12C6   ;2225   12C5:   Q_Q-K[.1]
U 12C6, 0019,2000,05C0,0800,0000,12C7   ;2226   12C6:   Q_Q-K[.1]
U 12C7, 0019,2000,05C0,0800,0000,12C8   ;2227   12C7:   Q_Q-K[.1]
U 12C8, 0019,2000,05C0,0800,0000,12C9   ;2228   12C8:   Q_Q-K[.1]
U 12C9, 0019,2000,05C0,0800,0000,12CA   ;2229   12C9:   Q_Q-K[.1]
U 12CA, 0019,2000,05C0,0800,0000,12CB   ;2230   12CA:   Q_Q-K[.1]
```

```
U 12CB, 0019,2000,05C0,0800,0000,12CC   ;2231   12CB:   Q_Q-K[.1]
U 12CC, 0019,2000,05C0,0800,0000,12CD   ;2232   12CC:   Q_Q-K[.1]
U 12CD, 0019,2000,05C0,0800,0000,12CE   ;2233   12CD:   Q_Q-K[.1]
U 12CE, 0019,2000,05C0,0800,0000,12CF   ;2234   12CE:   Q_Q-K[.1]
U 12CF, 0019,2000,05C0,0800,0000,12D0   ;2235   12CF:   Q_Q-K[.1]
U 12D0, 0019,2000,05C0,0800,0000,12D1   ;2236   12D0:   Q_Q-K[.1]
U 12D1, 0019,2000,05C0,0800,0000,12D2   ;2237   12D1:   Q_Q-K[.1]
U 12D2, 0019,2000,05C0,0800,0000,12D3   ;2238   12D2:   Q_Q-K[.1]
U 12D3, 0019,2000,05C0,0800,0000,12D4   ;2239   12D3:   Q_Q-K[.1]
U 12D4, 0019,2000,05C0,0800,0000,12D5   ;2240   12D4:   Q_Q-K[.1]
U 12D5, 0019,2000,05C0,0800,0000,12D6   ;2241   12D5:   Q_Q-K[.1]
U 12D6, 0019,2000,05C0,0800,0000,12D7   ;2242   12D6:   Q_Q-K[.1]
U 12D7, 0019,2000,05C0,0800,0000,12D8   ;2243   12D7:   Q_Q-K[.1]
U 12D8, 0019,2000,05C0,0800,0000,12D9   ;2244   12D8:   Q_Q-K[.1]
U 12D9, 0019,2000,05C0,0800,0000,12DA   ;2245   12D9:   Q_Q-K[.1]
U 12DA, 0019,2000,05C0,0800,0000,12DB   ;2246   12DA:   Q_Q-K[.1]
U 12DB, 0019,2000,05C0,0800,0000,12DC   ;2247   12DB:   Q_Q-K[.1]
U 12DC, 0019,2000,05C0,0800,0000,12DD   ;2248   12DC:   Q_Q-K[.1]
U 12DD, 0019,2000,05C0,0800,0000,12DE   ;2249   12DD:   Q_Q-K[.1]
U 12DE, 0019,2000,05C0,0800,0000,12DF   ;2250   12DE:   Q_Q-K[.1]
U 12DF, 0019,2000,05C0,0800,0000,12E0   ;2251   12DF:   Q_Q-K[.1]
U 12E0, 0019,2000,05C0,0800,0000,12E1   ;2252   12E0:   Q_Q-K[.1]
U 12E1, 0019,2000,05C0,0800,0000,12E2   ;2253   12E1:   Q_Q-K[.1]
U 12E2, 0019,2000,05C0,0800,0000,12E3   ;2254   12E2:   Q_Q-K[.1]
U 12E3, 0019,2000,05C0,0800,0000,12E4   ;2255   12E3:   Q_Q-K[.1]
U 12E4, 0019,2000,05C0,0800,0000,12E5   ;2256   12E4:   Q_Q-K[.1]
U 12E5, 0019,2000,05C0,0800,0000,12E6   ;2257   12E5:   Q_Q-K[.1]
U 12E6, 0019,2000,05C0,0800,0000,12E7   ;2258   12E6:   Q_Q-K[.1]
U 12E7, 0019,2000,05C0,0800,0000,12E8   ;2259   12E7:   Q_Q-K[.1]
U 12E8, 0019,2000,05C0,0800,0000,12E9   ;2260   12E8:   Q_Q-K[.1]
U 12E9, 0019,2000,05C0,0800,0000,12EA   ;2261   12E9:   Q_Q-K[.1]
U 12EA, 0019,2000,05C0,0800,0000,12EB   ;2262   12EA:   Q_Q-K[.1]
U 12EB, 0019,2000,05C0,0800,0000,12EC   ;2263   12EB:   Q_Q-K[.1]
U 12EC, 0019,2000,05C0,0800,0000,12ED   ;2264   12EC:   Q_Q-K[.1]
U 12ED, 0019,2000,05C0,0800,0000,12EE   ;2265   12ED:   Q_Q-K[.1]
U 12EE, 0019,2000,05C0,0800,0000,12EF   ;2266   12EE:   Q_Q-K[.1]
U 12EF, 0019,2000,05C0,0800,0000,12F0   ;2267   12EF:   Q_Q-K[.1]
U 12F0, 0019,2000,05C0,0800,0000,12F1   ;2268   12F0:   Q_Q-K[.1]
U 12F1, 0019,2000,05C0,0800,0000,12F2   ;2269   12F1:   Q_Q-K[.1]
U 12F2, 0019,2000,05C0,0800,0000,12F3   ;2270   12F2:   Q_Q-K[.1]
U 12F3, 0019,2000,05C0,0800,0000,12F4   ;2271   12F3:   Q_Q-K[.1]
U 12F4, 0019,2000,05C0,0800,0000,12F5   ;2272   12F4:   Q_Q-K[.1]
U 12F5, 0019,2000,05C0,0800,0000,12F6   ;2273   12F5:   Q_Q-K[.1]
U 12F6, 0019,2000,05C0,0800,0000,12F7   ;2274   12F6:   Q_Q-K[.1]
U 12F7, 0019,2000,05C0,0800,0000,12F8   ;2275   12F7:   Q_Q-K[.1]
U 12F8, 0019,2000,05C0,0800,0000,12F9   ;2276   12F8:   Q_Q-K[.1]
U 12F9, 0019,2000,05C0,0800,0000,12FA   ;2277   12F9:   Q_Q-K[.1]
U 12FA, 0019,2000,05C0,0800,0000,12FB   ;2278   12FA:   Q_Q-K[.1]
U 12FB, 0019,2000,05C0,0800,0000,12FC   ;2279   12FB:   Q_Q-K[.1]
U 12FC, 0019,2000,05C0,0800,0000,12FD   ;2280   12FC:   Q_Q-K[.1]
U 12FD, 0019,2000,05C0,0800,0000,12FE   ;2281   12FD:   Q_Q-K[.1]
U 12FE, 0019,2000,05C0,0800,0000,12FF   ;2282   12FE:   Q_Q-K[.1]
U 12FF, 0019,2002,05C0,0800,0000,0001   ;2283   12FF:   Q_Q-K[.1],RETURN1
                                        ;2284
                                        ;2285
```

```
                                         ;2286   ;+
                                         ;2287   ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
                                         ;2288   ; CACHE REFERANCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
                                         ;2289   ; IS COMPLETELY FULL OF DATA.
                                         ;2290   ;
                                         ;2291   ; BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
                                         ;2292   ;-
                                         ;2293
U 11C5, 3000,003C,0180,6000,0000,11C6    ;2294   IBWAIT: LOAD.IB,IBC/START
U 11C6, 0000,003C,0180,F800,0000,11C7    ;2295           MCT/ALLOW.IB.READ
U 11C7, 0000,003C,0180,F800,0000,11C8    ;2296           MCT/ALLOW.IB.READ
U 11C8, 0000,003C,0180,F800,0000,11C9    ;2297           MCT/ALLOW.IB.READ
U 11C9, 0000,003C,0180,F800,0000,11CA    ;2298           MCT/ALLOW.IB.READ
                                         ;2299   SYNC01:
U 11CA, 0000,003C,0180,F800,0000,11CB    ;2300   WAIT1:  MCT/ALLOW.IB.READ
U 11CB, 1000,003E,0180,F800,0000,0001    ;2301           MCT/ALLOW.IB.READ,IBC/STOP,RETURN1
                                         ;2302
                                         ;2303
                                         ;2304   IBWAITONCE:
U 11CC, 3000,003C,0180,6000,0000,11CA    ;2305           LOAD.IB,IBC/START,J/WAIT1
```

```
                                             .PAGE   "TEST 11C       VALID BIT GENERATION (CONTINUED)"
                                             ;**********************************************************************
                                             ;++
                                             ; TEST  11C     VALID BIT GENERATION (CONTINUED)
                                             ;
                                             ; TEST DESCRIPTION
                                             ;       THIS TEST CHECKS THAT THE CORRECT BYTES ARE MARKED VALID, WHEN
                                             ;       THEY ARE RECEIVED FROM THE CACHE, AS A FUNCTION OF THE VALUES
                                             ;       OF IBA BITS<1:0>. THIS IS DONE BY LOADING THE IBA WITH THE SPECIFIED
                                             ;       VALUE OF BITS<1:0>, STARTING THE INSTRUCTION BUFFER, WAITING FOR
                                             ;       THE SPECIFIED NUMBER OF CYCLES, FROM THE CACHE, STOPPING THE IB,
                                             ;       AND CHECKING THAT THE APPROPRIATE BYTES WERE MARKED VALID.
                                             ;
                                             ;       SUBTST 1 - CHECK THAT AN IBA VALUE OF 10 AND 1 READ FROM CACHE AND
                                             ;                  BYTES 5-0 ARE ALREADY VALID, VALIDATES BYTES 6 & 7.
                                             ;       SUBTST 2 - CHECK THAT AN IBA VALUE OF 01 AND 1 READ FROM CACHE AND
                                             ;                  BYTES 6-0 ARE ALREADY VALID, VALIDATES BYTE 7.
                                             ;
                                             ; LOGIC DESCRIPTION
                                             ;       THIS TEST CHECKS THE VALID BIT GENERATION LOGIC ON THE IDP MODULE.
                                             ;
                                             ; ERROR DESCRIPTION
                                             ;       DATA: EXPECTED MICRO PC BITS<7:0>
                                             ;             RECEIVED MICRO PC BITS<7:0>
                                             ;             BYTE LOOP COUNT -- SHOWS WHICH BYTE WAS BEING CHECK FOR VALIDITY:
                                             ;                7=BYTE 0, 6=BYTE 1, 5=BYTE 2, 4=BYTE 3, ETC.
                                             ;       THE EXPECTED ADDRESS WILL EITHER BE 8F (FOR VALID DATA) OR
                                             ;       7E (FOR INVALID DATA).
                                             ;
                                             ; SYNC POINT DESCRIPTION
                                             ;       ADDRESS SYNC01 - LOCATION WHEN CACHE DATA IS WRITTEN INTO THE IB
                                             ;                        WHEN 1 READ FROM CACHE IS REQUESTED, OR WHERE
                                             ;                        THE SECOND LONG WORD FROM CACHE IS WRITTEN
                                             ;                        INTO THE IB WHEN 2 READS FROM THE CACHE ARE REQUESTED.
                                             ;--
                                             ;**********************************************************************
                                             =0
U 1008, 0018,0039,0D80,09F8,0000,1191        T11C:   NEWTST[.3]
U 1009, 0000,003C,0180,0800,0000,100A                NOP
U 100A, 0818,0039,0180,0800,0000,11B9        =0      D_K[.8],CALL[DCF]              ; GEN EXFECTED DATA
U 100B, 0001,003C,0180,0A90,0000,11CD                R[2]_D                         ; SAVE

                                             ;//////////////////////////////////////////////////////////////////////
                                             ;+
                                             ; CHECK THAT BYTES 6 AND 7 LOAD WHEN IBA=2 AND BYTES 0-5 ARE VALID
                                             ;-

U 11CD, 0018,0038,0980,0A88,0000,100C        T11CS1: R[1]_K[.2]                     ; SET ADR OF IB DATA
U 100C, 0000,003D,0180,0800,0000,11BF        =0      SUBTEST
U 100D, 0000,003C,0180,0A10,0000,11CE                LAB_R[2]
U 11CE, 0000,003C,0180,09F0,0000,100E                RC[0E]_LA                      ; LOAD EXP ADR

U 100E, 0000,003D,0180,0800,0000,11A5        =0      ERLOOP
U 100F, 0018,0038,0180,09E0,0000,1010                RC[0C]_K[.8]                   ; SET THE LOOP COUNT
U 1010, 2003,003D,0180,0800,4200,11C5        =0      ALU_0(A),FLUSH.IB,CALL,J/IBWAIT ; FILL THE IBUFFER
```

```
U 1011, 4000,003C,0180,0800,0000,1012   ;2361           IBC/CLR.0.1                         ; MAKE BYTES 6 AND 7 INVALID
U 1012, 0000,003D,0180,0A09,0200,11CC   ;2362   =0      ALU_R[1],VA_ALU,PCK/PC_VA,CALL,J/IBWAITONCE ; LOAD A NEW PC OF IBA=2
U 1013, 0810,0038,0180,0970,0000,1014   ;2363   T11CL12:D_R̄C[0E]                           ; GET EXP ADR
U 1014, 0000,003D,0180,0800,0000,11C4   ;2364   =0      CĀLL,J/DISPAT                       ; CHECK THE BYTES
U 1015, 001D,A000,0180,0800,0010,11CF   ;2365           ALU_Q-D,CLK.UBCC,BYTE               ; ADR OK?
U 11CF, 0810,0138,0180,0960,0000,1016   ;2366           Z?,D̄_RC[0C]                        ; BRANCH IF YES
U 1016, 0001,A03D,0180,09E8,0000,11A6   ;2367   =0      ERROR̄1,RC[0D]_Q,BYTE                ;
U 1017, 0019,8000,0580,09E0,0010,11D0   ;2368           RC[0C]_D-K[.1],CLK.UBCC,BYTE        ; DECREMENT LOOP COUNT
U 11D0, C000,013C,0180,0800,0000,1018   ;2369           Z?,IBC7CLR.0                        ; BRANCH IF DONE
U 1018, 0000,003C,0180,0A10,0000,1013   ;2370   =0      LAB_R[2],J/T11CL12                  ; CONTINUE TESTING
U 1019, 0000,003C,0180,0800,0000,101A   ;2371           NOP
                                        ;2372   ;/////////////////////////////////////////////////////////////////////////
                                        ;2373   ;+
                                        ;2374   ; CHECK THAT BYTE 7 LOADS WHEN IBA=1 AND BYTES 0-6 ARE VALID
                                        ;2375   ;-
                                        ;2376
U 101A, 0000,003D,0180,0800,0000,11BF   ;2377   =0      SUBTEST
U 101B, 0018,0038,0580,0A88,0000,101C   ;2378           R[1]_K[.1]                          ; SET IBA = 1
                                        ;2379   T11CS2:
U 101C, 0000,003D,0180,0800,0000,11A5   ;2380   =0      ERLOOP
U 101D, 0018,0038,0180,09E0,0000,101E   ;2381           RC[0C]_K[.8]                        ; SET THE LOOP COUNT
U 101E, 2003,003D,0180,0800,4200,11C5   ;2382   =0      ALU_0(Ā),FLUSH.IB,CALL,J/IBWAIT     ; FILL THE IBUFFER
U 101F, C000,003C,0180,0800,0000,1020   ;2383           IBC7CLR.0                           ; MAKE BYTE 7 INVALID
U 1020, 0000,003D,0180,0A09,0200,11CC   ;2384   =0      ALU_R[1],VA_ALU,PCK/PC_VA,CALL,J/IBWAITONCE ; LOAD A NEW PC OF IBA=1
U 1021, 0810,0038,0180,0970,0000,1022   ;2385   T11CL13:D_R̄C[0E]                           ; GET EXP ADR
U 1022, 0000,003D,0180,0800,0000,11C4   ;2386   =0      CĀLL,J/DISPAT                       ; CHECK THE BYTES
U 1023, 001D,A000,0180,0800,0010,11D1   ;2387           ALU_Q-D,CLK.UBCC,BYTE               ; ADR OK?
U 11D1, 0810,0138,0180,0960,0000,1024   ;2388           Z?,D̄_RC[0C]                        ; BRANCH IF YES
U 1024, 0001,A03D,0180,09E8,0000,11A6   ;2389   =0      ERROR̄1,RC[0D]_Q,BYTE                ;
U 1025, 0019,8000,0580,09E0,0010,11D2   ;2390           RC[0C]_D-K[.1],CLK.UBCC,BYTE        ; DECREMENT LOOP COUNT
U 11D2, C000,013C,0180,0800,0000,1026   ;2391           Z?,IBC7CLR.0                        ; BRANCH IF DONE
U 1026, 0000,003C,0180,0A10,0000,1021   ;2392   =0      LAB_R[2],J/T11CL13                  ; CONTINUE TESTING
U 1027, 0000,003C,0180,0800,0000,1028   ;2393           NOP
                                        ;2394
                                        ;2395   ; THE FOLLOWING IS THE IB DATA IS USED IN THE ABOVE TEST
                                        ;2396   ;% 0
                                        ;2397   ;$ 0000,0000,0000,0000,0000,0000,0000,0000
                                        ;2398  .PAGE   "TEST 11D       STALL CONTROL LOGIC"
                                        ;2399  ;*********************************************************************
                                        ;2400  ;++
                                        ;2401  ; TEST  11D     STALL CONTROL LOGIC
                                        ;2402  ;
                                        ;2403  ; TEST DESCRIPTION
                                        ;2404  ;       THIS TEST CHECKS THOSE CONDITIONS THAT CAN CAUSE THE INSTRUCTION
                                        ;2405  ;       BUFFER TO ASCERT THE STALL SIGNAL.
                                        ;2406  ;       SINCE THE STALL CONDITION IS A FUNCTION OF HOW MANY VALID BYTES ARE
                                        ;2407  ;       IN THE BUFFER, DIFFERENT VALUES OF IBA BITS<1:0> ARE USED TO LOAD
                                        ;2408  ;       THE APPROPRIATE NUMBER OF BYTES INTO THE BUFFER. THE STALL SIGNAL
                                        ;2409  ;       IS ALSO A FUNCTION OF THE OPCODE IN BYTE 0 OF THE BUFFER.
                                        ;2410  ;       WITH THE ABOVE TWO CONSTRAINTS IN MIND, THE TEST WORKS AS FOLLOWS:
                                        ;2411  ;       READ THE DATA TO LOAD INTO THE IB FROM THE CACHE AND SAVE IT. THEN
                                        ;2412  ;       READ THE IBA VALUE TO USE FROM THE CACHE AND LOAD IT INTO THE VA.
                                        ;2413  ;       THEN WRITE THE IB DATA (THAT WAS SAVED), TO THE CACHE.
                                        ;2414  ;       THE IB THEN PICKS UP THE APPROPRIATE DATA WITH THE APPROPRIATE VALUE
                                        ;2415  ;       OF IBA BITS<1:0>.
                                        ;2416  ;
                                        ;2417  ;       SUBTST 1 - IB STALL IS TRUE WITH 5 DIFFERANT OP CODES.
                                        ;2418  ;       SUBTST 2 - IB STALL IS FALSE WITH 4 DIFFERANT OPCODES.
                                        ;2419  ;       SUBTST 3 - IB STALL TRUE BECAUSE BYTE 1 IS INVALID.
                                        ;2420  ;       SUBTST 4 - IB STALL TRUE BECAUSE BYTE 5 IS INVALID.
                                        ;2421  ;       SUBTST 5 - IB STALL TRUE BECAUSE BYTE 2 IS INVALID AND "VAX DECODE
                                        ;2422  ;                  3" IS ASSERTED, AND "BDEST" IS DEASSERTED.
                                        ;2423  ;
                                        ;2424  ; LOGIC DESCRIPTION
                                        ;2425  ;       THIS TEST CHECKS THE LOGIC ON THE IRC MODULE THAT GENERATES THE
                                        ;2426  ;       "STALL+SVC" SIGNAL IN VAX MODE.
                                        ;2427  ;
                                        ;2428  ; ERROR DESCRIPTION
                                        ;2429  ;       DATA: EXPECTED MICRO PC BITS<7:0>
                                        ;2430  ;             RECEIVED MICRO PC BITS<7:0>
                                        ;2431  ;             LOOP COUNT THAT INDICATES WHAT OPCODE IS IN THE BUFFER
                                        ;2432  ;               (SEE THE DATA TABLE AT THE END OF THE TEST)
                                        ;2433  ;
                                        ;2434  ; SYNC POINT DESCRIPTION
                                        ;2435  ;       SUBTST 1 - SYNC02--"STALL+SVC" SHOULD BE TRUE
                                        ;2436  ;       SUBTST 2 - SYNC03--"STALL+SVC" SHOULD BE FLASE
                                        ;2437  ;       SUBTST 3 - SYNC04--"STALL+SVC" SHOULD BE TRUE
                                        ;2438  ;       SUBTST 4 - SYNC05--"STALL+SVC" SHOULD BE TRUE
                                        ;2439  ;       SUBTST 5 - SYNC06--"STALL+SVC" SHOULD BE TRUE
                                        ;2440  ;--
                                        ;2441  ;*********************************************************************
                                        ;2442  =0
U 1028, 0018,0039,0D80,09F8,0000,1191   ;2443  T11D:   NEWTST[.3]                      ;
U 1029, 0003,003C,0180,0A88,0000,11D3   ;2444          R[1]_0
U 11D3, 0018,0038,6580,0A90,0000,11D4   ;2445          R[2]_K[.10]                     ; ADDRESS OF IB DATA
U 11D4, 0018,0038,3180,0A80,0000,102A   ;2446          R[0]_K[.40]                     ; ADDRESS OF IB ADDRESS
U 102A, 0818,0039,5D80,0800,0000,11B8   ;2447  =0      D_K[.7],CALL,J/DCE              ; GEN ADDRESS OF STALL MICRO STATE
U 102B, 0001,003C,0180,09F0,0000,102C   ;2448          RC[0E]_D                        ; SAVE
                                        ;2449
                                        ;2450  ;////////////////////////////////////////////////////////////////////
                                        ;2451  ;+
                                        ;2452  ; IB STALL TRUE AND ONLY ONE IB FETCH
                                        ;2453    ;-
                                        ;2454
U 102C, 0000,003D,0180,0800,0000,11BF   ;2455    =0      SUBTEST
U 102D, 0818,0038,1180,0800,0000,11D5   ;2456    T11DS1: D_K[.4]                           ; SET THE LOOP COUNT
U 11D5, 0019,0014,0580,09E0,0000,11D6   ;2457            RC[OC]_D+K[.1]
U 11D6, 0000,003C,0180,0A10,0200,11D7   ;2458    T11DL1: VA_R[2]                           ; LOAD ADR OF IB DATA
U 11D7, 0000,403C,0180,C800,0000,11D8   ;2459            D[WORD]_CACHE.P                   ; FETCH THE DATA
U 11D8, 0000,003C,01E0,0A00,0200,11D9   ;2460            VA_R[0],Q_D                       ; LOAD ADDRESS OF IB ADDRESS
U 11D9, 0000,403C,0180,C800,0000,11DA   ;2461            D[WORD]_CACHE.P                   ; FETCH THE ADDRESS
U 11DA, 0C03,403C,0180,0A88,0200,11DB   ;2462            VA_D.OXT[WORD],R[1]_ALU,D_Q       ; LOAD THE ADDRESS
U 11DB, 0000,403C,0180,A800,0000,102E   ;2463            CACHE.P_D[WORD]                   ; WRITE THE DATA TO THE ADDRESS
U 102E, 0000,003D,0180,0800,0000,11A5   ;2464    =0      ERLOOP
U 102F, 0810,0038,0180,0970,0000,1030   ;2465            D_RC[OE]                          ; GET EXP DISPAT ADDRESS
U 1030, 2000,003D,0180,0A08,4200,11CC   ;2466    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAITONCE ; LOAD THE DATA
U 1031, 0000,003C,0180,0800,0000,1032   ;2467    SYNC02: NOP
U 1032, 0000,003D,0180,0800,0000,11C4   ;2468    =0      CALL,J/DISPAT                     ; EXECUT THE CALL 3
U 1033, 001D,A000,0180,0800,0010,11DC   ;2469            ALU_Q-D,CLK.UBCC,BYTE             ; ADDRESS OK?
U 11DC, 0800,013C,0180,0A10,0000,1034   ;2470            Z?,D_R[2]                         ; BRANCH IF YES
U 1034, 0001,A03D,0180,09E8,0000,11A8   ;2471    =0      ERROR2,RC[OD]_Q,BYTE              ;
                                        ;2472
                                        ;2473    ;+
                                        ;2474    ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;2475    ;-
                                        ;2476
U 1035, 0800,003C,0180,0A10,0000,11DD   ;2477            D_R[2]
U 11DD, 0019,0014,0980,0A90,0000,11DE   ;2478            R[2]_D+K[.2]                      ; UPDATE ADR OF IB DATA
U 11DE, 0000,003C,0180,0A00,0000,11DF   ;2479            LAB_R[0]
U 11DF, 0018,0014,0980,0A80,0000,11E0   ;2480            R[0]_LA+K[.2]                     ; UPDATE ADR OF IB ADDRESS
U 11E0, 0810,0038,0180,0960,0000,11E1   ;2481            D_RC[OC]
U 11E1, 0019,8000,0580,09E0,0010,11E2   ;2482            RC[OC]_D-K[.1],CLK.UBCC,BYTE      ; DECREMENT LOOP COUNT
U 11E2, 0000,013C,0180,0800,0000,1036   ;2483            Z?                                ; BRANCH IF DONE
U 1036, 0000,003C,0180,0800,0000,11D6   ;2484    =0      J/T11DL1
                                        ;2485
                                        ;2486
                                        ;2487    ;///////////////////////////////////////////////////////////////////
                                        ;2488    ;+
                                        ;2489    ; IB STALL FALSE ONLY ONE CYCLE
                                        ;2490    ;-
                                        ;2491
U 1037, 0000,003C,0180,0800,0000,1038   ;2492            NOP
U 1038, 0000,003D,0180,0800,0000,11BF   ;2493    =0      SUBTEST
U 1039, 0018,0038,1180,09E0,0000,11E3   ;2494    T11DS2: RC[OC]_K[.4]                      ; SET THE LOOP COUNT
U 11E3, 0000,003C,0180,0A10,0200,11E4   ;2495    T11DL2: VA_R[2]                           ; LOAD ADR OF IB DATA
U 11E4, 0000,403C,0180,C800,0000,11E5   ;2496            D[WORD]_CACHE.P                   ; FETCH THE DATA
U 11E5, 0000,003C,01E0,0A00,0200,11E6   ;2497            VA_R[0],Q_D                       ; LOAD ADDRESS OF IB ADDRESS
U 11E6, 0000,403C,0180,C800,0000,11E7   ;2498            D[WORD]_CACHE.P                   ; FETCH THE ADDRESS
U 11E7, 0C03,403C,0180,0A88,0200,11E8   ;2499            VA_D.OXT[WORD],R[1]_ALU,D_Q       ; LOAD THE ADDRESS
U 11E8, 0000,403C,0180,A800,0000,103A   ;2500            CACHE.P_D[WORD]                   ; WRITE THE DATA TO THE ADDRESS
U 103A, 0000,003D,0180,0800,0000,11A5   ;2501    =0      ERLOOP
U 103B, 0810,0038,0180,0970,0000,103C   ;2502            D_RC[OE]                          ; GET EXP DISPAT ADDRESS
U 103C, 2000,003D,0180,0A08,4200,11CC   ;2503    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAITONCE ; LOAD THE DATA
U 103D, 0000,003C,0180,0800,0000,103E   ;2504    SYNC03: NOP
U 103E, 0000,003D,0180,0800,0000,11C4   ;2505    =0      CALL,J/DISPAT                     ; EXECUT THE CALL 3
U 103F, 001D,A000,0180,0800,0010,11E9   ;2506            ALU_Q-D,CLK.UBCC,BYTE             ; ADDRESS OK?
U 11E9, 0800,013C,0180,0A10,0000,1040   ;2507            Z?,D_R[2]                         ; BRANCH IF NO
```

```
U 1040, 0800,003C,0180,0A10,0000,11EA   ;2508   =0      D_R[2],J/T11DP1
U 1041, 0001,203D,0180,09E8,0000,11A6   ;2509           ERROR1,RC[0D]_Q
U 11EA, 0019,0014,0980,0A90,0000,11EB   ;2510   T11DP1: R[2]_D+K[.2]                    ; UPDATE ADR OF IB DATA
U 11EB, 0000,003C,0180,0A00,0000,11EC   ;2511           LAB_R[0]
U 11EC, 0018,0014,0980,0A80,0000,11ED   ;2512           R[0]_LA+K[.2]                   ; UPDATE ADR OF IB ADDRESS
U 11ED, 0810,0038,0180,0960,0000,11EE   ;2513           D_RC[0C]
U 11EE, 0019,8000,0580,09E0,0010,11EF   ;2514           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 11EF, 0000,013C,0180,0800,0000,1042   ;2515           Z?                              ; BRANCH IF DONE
U 1042, 0000,003C,0180,0800,0000,11E3   ;2516   =0      J/T11DL2
                                        ;2517
                                        ;2518
                                        ;2519   ;//////////////////////////////////////////////////////////////////////
                                        ;2520   ;+
                                        ;2521   ; IB STALL TRUE, BYTE 1 INVALID
                                        ;2522   ;-
                                        ;2523
U 1043, 0000,003C,0180,0800,0000,1044   ;2524           NOP
U 1044, 0000,003D,0180,0800,0000,11BF   ;2525   =0      SUBTEST
U 1045, 0000,003C,0180,0A10,0200,11F0   ;2526   T11DS3: VA_R[2]                         ; LOAD ADR OF IB DATA
U 11F0, 0000,403C,0180,C800,0000,11F1   ;2527           D[WORD]_CACHE.P                 ; FETCH THE DATA
U 11F1, 0000,003C,01E0,0A00,0200,11F2   ;2528           VA_R[0],Q_D                     ; LOAD ADDRESS OF IB ADDRESS
U 11F2, 0000,403C,0180,C800,0000,11F3   ;2529           D[WORD]_CACHE.P                 ; FETCH THE ADDRESS
U 11F3, 0C03,403C,0180,0A88,0200,11F4   ;2530           VA_D.OXT[WORD],R[1]_ALU,D_Q     ; LOAD THE ADDRESS
U 11F4, 0000,403C,0180,A800,0000,1046   ;2531           CACHE.P_D[WORD]                 ; WRITE THE DATA TO THE ADDRESS
U 1046, 0000,003D,0180,0800,0000,11A5   ;2532   =0      ERLOOP
U 1047, 0810,0038,0180,0970,0000,1048   ;2533           D_RC[0E]                        ; GET EXP DISPAT ADDRESS
U 1048, 2000,003D,0180,0A08,4200,11CC   ;2534   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAITONCE ; LOAD THE DATA
U 1049, C000,003C,0180,0800,0000,104A   ;2535           IBC7CLR.0                       ; MAKE BYTE 1 INVALID
                                        ;2536   =0
U 104A, 0000,003D,0180,0800,0000,11C4   ;2537   SYNC04: CALL,J/DISPAT                   ; EXECUT THE CALL 3
U 104B, 001D,A000,0180,0800,0010,11F5   ;2538           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 11F5, 0800,013C,0180,0A10,0000,104C   ;2539           Z?,D_R[2]                       ; BRANCH IF YES
U 104C, 0001,A03D,0180,09E8,0000,11A6   ;2540   =0      ERROR1,RC[0D]_Q,BYTE            ;
U 104D, 0800,003C,0180,0A10,0000,11F6   ;2541           D_R[2]
U 11F6, 0019,0014,0980,0A90,0000,11F7   ;2542           R[2]_D+K[.2]                    ; UPDATE ADR OF IB DATA
U 11F7, 0000,003C,0180,0A00,0000,11F8   ;2543           LAB_R[0]
U 11F8, 0018,0014,0980,0A80,0000,1050   ;2544           R[0]_LA+K[.2]                   ; UPDATE ADR OF IB ADDRESS
                                        ;2545
                                        ;2546
                                        ;2547   ;/////////////////////////////////////////////,////////////////////////
                                        ;2548   ;+
                                        ;2549   ; IB STALL TRUE, BYTE 5 INVALID
                                        ;2550   ;-
                                        ;2551
U 1050, 0000,003D,0180,0800,0000,11BF   ;2552   =0      SUBTEST
U 1051, 0018,0038,0980,09E0,0000,11F9   ;2553   T11DS4: RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 11F9, 0000,003C,0180,0A10,0200,11FA   ;2554   T11DL3: VA_R[2]                         ; LOAD ADR OF IB DATA
U 11FA, 0000,003C,0180,C800,0000,11FB   ;2555           D[LONG]_CACHE.P                 ; FETCH THE DATA
U 11FB, 0000,003C,01E0,0A00,0200,11FC   ;2556           VA_R[0],Q_D                     ; LOAD ADDRESS OF IB ADDRESS
U 11FC, 0000,403C,0180,C800,0000,11FD   ;2557           D[WORD]_CACHE.P                 ; FETCH THE ADDRESS
U 11FD, 0C03,403C,0180,0A88,0200,11FE   ;2558           VA_D.OXT[WORD],R[1]_ALU,D_Q     ; LOAD THE ADDRESS
U 11FE, 0000,003C,0180,A800,0000,11FF   ;2559           CACHE.P_D[LONG]                 ; WRITE THE DATA TO THE ADDRESS
U 11FF, 0800,003C,0180,0A10,0000,1300   ;2560           D_R[2]
U 1300, 001B,4014,1180,0800,0200,1301   ;2561           VA_D.OXT[WORD]+K[.4]            ; GOING TO FETCH NEXT LONG WORD
U 1301, 0000,003C,0180,C800,0000,1302   ;2562           D[LONG]_CACHE.P                 ; FETCH THE DATA
```

```
U 1302, 0800,003C,01E0,0A08,0000,1303   ;2563           D_R[1],Q_D
U 1303, 0C1B,4014,1180,0800,0200,1304   ;2564           VA_D.OXT[WORD]+K[.4],D_Q
U 1304, 0000,003C,0180,A800,0000,1052   ;2565           CACHE.P_D[LONG]                ; WRITE SECOND LONG WORD
U 1052, 0000,003D,0180,0800,0000,11A5   ;2566   =0      ERLOOP
U 1053, 0810,0038,0180,0970,0000,1054   ;2567           D_RC[0E]                       ; GET EXP DISPAT ADDRESS
U 1054, 2000,003D,0180,0A08,4200,11C5   ;2568   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE DATA
U 1055, 4000,003C,0180,0800,0000,1305   ;2569           IBC7CLR.0.1                    ; MAKE BYTE 5 INVALID
U 1305, C000,003C,0180,0800,0000,1056   ;2570   SYNC05: IBC/CLR.0
U 1056, 0000,003D,0180,0800,0000,11C4   ;2571   =0      CALL,J/DISPAT                  ; EXECUT THE CALL 3
U 1057, 001D,A000,0180,0800,0010,1306   ;2572           ALU_Q-D,CLK.UBCC,BYTE          ; ADDRESS OK?
U 1306, 0800,013C,0180,0A10,0000,1058   ;2573           Z?,D_R[2]                      ; BRANCH IF YES
U 1058, 0001,A03D,0180,09E8,0000,11A8   ;2574   =0      ERROR2,RC[0D]_Q,BYTE           ;
U 1059, 0800,003C,0180,0A10,0000,1307   ;2575           D_R[2]
U 1307, 0019,0014,0180,0A90,0000,1308   ;2576           R[2]_D+K[.8]                   ; UPDATE ADR OF IB DATA
U 1308, 0000,003C,0180,0A00,0000,1309   ;2577           LAB_R[0]
U 1309, 0018,0014,0980,0A80,0000,130A   ;2578           R[0]_LA+K[.2]                  ; UPDATE ADR OF IB ADDRESS
U 130A, 0810,0038,0180,0960,0000,130B   ;2579           D_RC[0C]
U 130B, 0019,8000,0580,09E0,0010,130C   ;2580           RC[0C]_D-K[.1],CLK.UBCC,BYTE   ; DECREMENT LOOP COUNT
U 130C, 0000,013C,0180,0800,0000,105C   ;2581           Z?                             ; BRANCH IF DONE
U 105C, 0000,003C,0180,0800,0000,11F9   ;2582   =0      J/T11DL3
                                        ;2583
                                        ;2584
                                        ;2585   ;//////////////////////////////////////////////////////////////////////////
                                        ;2586   ;+
                                        ;2587   ; IB STALL TRUE--BYTE 2 INVALID AND VAX DECODE 3 AND NOT BDEST
                                        ;2588   ;-
                                        ;2589
U 105D, 0000,003C,0180,0800,0000,1060   ;2590           NOP
U 1060, 0000,003D,0180,0800,0000,11BF   ;2591   =0      SUBTEST
U 1061, 0000,003C,0180,0A10,0200,130D   ;2592   T11DS5: VA_R[2]                        ; LOAD ADR OF IB DATA
U 130D, 0000,003C,0180,C800,0000,130E   ;2593           D[LONG]_CACHE.P                ; FETCH THE DATA
U 130E, 0000,003C,01E0,0A00,0200,130F   ;2594           VA_R[0],Q_D                    ; LOAD ADDRESS OF IB ADDRESS
U 130F, 0000,403C,0180,C800,0000,1310   ;2595           D[WORD]_CACHE.P                ; FETCH THE ADDRESS
U 1310, 0C03,403C,0180,0A88,0200,1311   ;2596           VA_D.OXT[WORD],R[1]_ALU,D_Q    ; LOAD THE ADDRESS
U 1311, 0000,003C,0180,A800,0000,1312   ;2597           CACHE.P_D[LONG]                ; WRITE THE DATA TO THE ADDRESS
U 1312, 0000,003C,0180,0A08,0000,1313   ;2598           LAB_R[1]
U 1313, 0018,0014,0580,0A88,0000,1062   ;2599           R[1]_LA+K[.1]
U 1062, 0000,003D,0180,0800,0000,11A5   ;2600   =0      ERLOOP
U 1063, 0810,0038,0180,0970,0000,1064   ;2601           D_RC[0E]                       ; GET EXP DISPAT ADDRESS
U 1064, 2000,003D,0180,0A08,4200,11CC   ;2602   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAITONCE ; LOAD THE DATA
U 1065, D000,003C,0180,0800,0000,1066   ;2603           IBC7CLR.1
                                        ;2604   =0
U 1066, 0000,003D,0180,0800,0000,11C4   ;2605   SYNC06: CALL,J/DISPAT                  ; EXECUT THE CALL 3
U 1067, 001D,A000,0180,0800,0010,1314   ;2606           ALU_Q-D,CLK.UBCC,BYTE          ; ADDRESS OK?
U 1314, 0800,013C,0180,0A10,0000,1068   ;2607           Z?,D_R[2]                      ; BRANCH IF YES
U 1068, 0001,A03D,0180,09E8,0000,11A6   ;2608   =0      ERROR1,RC[0D]_Q,BYTE           ;
U 1069, 0000,003C,0180,0800,0000,106A   ;2609           NOP
                                        ;2610
                                        ;2611   ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2612   ;% 10
                                        ;2613   ; SUBTEST 1
                                        ;2614   ;$ 8F90,C090,8FB0,C095,0030
                                        ;2615   ; SUBTEST 2
                                        ;2616   ;$ 8FB0,8F95,5073,5094
                                        ;2617   ; SUBTEST 3
```

```
;2618    ;$ 9050
;2619    ; SUBTEST 4
;2620    ;$ 0000,9000,00E0,0000,0000,D000,008F,0000
;2621    ; SUBTEST 5
;2622    ;$ 8100,5000,5050
;2623    ;
;2624    ; FOLLOWING IS THE ADDRESS TO WRITE THE DATA AT FOR THE ABOVE TEST:
;2625    ;% 40
;2626    ; SUBTEST 1
;2627    ;$ 502,501,501,501,502
;2628    ; SUBTEST 2
;2629    ;$ 500,501,502,502
;2630    ; SUBTEST 3
;2631    ;$ 502
;2632    ; SUBTEST 4
;2633    ;$ 500,500
;2634    ; SUBTEST 5
;2635    ;$ 500
;2636
```

```
.PAGE   "TEST 11E       'A FORK' OP CODE DECODE"
;***********************************************************************
;++
; TEST  11E     "A FORK" OP CODE DECODE
;
; TEST DESCRIPTION
;       THIS TEST CHECKS ALL THE INSTRUCTION ENTRY POINTS ON THE A FORK.
;       THIS IS DONE BY LOADING THE OPCODE INTO THE IB, EXECUTING THE
;       SUB/SPEC FUNCTION, AND CHECKING THE ADDRESS.
;       FOLLOWING IS A LIST OF THE OPCODES THAT ARE CHECKED AND THEIR EXPECTED
;       A FORK ADDRESS. THE MOVB'S AT THE END OF THE LIST ARE USED TO CHECK
;       THE SPECIFIER DECODE ADDRESSES.
;
;       INSTR   ADDRESS                         INSTR   ADDRESS
;       -----   -------                         -----   -------
;
;       HALT    8F                              NOP     8E
;       REI     8D                              BPT     8C
;       RET     8B                              RSB     8A
;       LDPCTX  89                              SVPCTX  88
;       BSBB    82                              BRB     CE
;       BSBW    82                              BRW     CE
;       RESERV  87                              ESCD    85
;       ESCE    81                              ESCF    83
;       CLRQ    42                              CLRB    4F      SPECIFIED INDEPENDENT
;                                  !-------------------------------
;       MOVPSL  4E                 !            ADDF2   64
;       ---------------------------!
;       ADDF2   40                              ADDD2   66
;       ADDD2   42                              ADDB2   E4
;       ADDB2   C0                              CMPB    A4      OPTIMIZED
;                                  !-------------------------------
;       CMPB    80                 !            TSTF    A8
;       ---------------------------!
;       TSTB    AF                              INCB    2F
;       BLBS    AE                              SOBGEQ  2E      EXECUTE IF R
;       ----------------------------------------------------------
;       MULF2   4                               MULD2   6
;       MOVQ    2                               MOVQ    1F      SPECIFIED DEPENDENT
;       ----------------------------------------------------------
;       MOVB    0                               MOVB    8       OPTIMIZED SELECT SPECIFIER
;       MOVB    C                               MOVB    A
;       MOVB    9                               MOVB    B
;       MOVB    D                               MOVB    F
;       MOVB    19                              MOVB    1B
;
; LOGIC DESCRIPTION
;       THIS TEST CHECKS THAT VAX DECODE PROMS ON THE IRC MODULE.
;
; ERROR DESCRIPTION
;       DATA: EXPECTED MICRO PC BITS <7:0>
;             RECEIVED MICRO PC BITS <7:0>
;             LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY UNDER TEST,
;               I.E., 2E=HALT, 2D=NOP, 2C=REI, 2B=BPT, 2A=RET, ETC.
;
```

```
                                        ;2692   ; SYNC POINT DESCRIPTION
                                        ;2693   ;       ADDRESS SYNC00--MICRO PC BITS ARE ENABLED AT THE INSTRUCTION
                                        ;2694   ;                       FOLLOWING THIS ONE.
                                        ;2695   ;--
                                        ;2696   ;*******************************************************************
                                        ;2697   =0
U 106A, 0018,0039,0D80,09F8,0000,1191   ;2698   T11E:   NEWTST[.3]
U 106B, 0818,0038,5180,0800,0000,1315   ;2699           D_K[.1E]                        ; SET LOOP COUNT TO -2E(16)
U 1315, 0000,003C,6580,0800,0000,1316   ;2700           KMX/.10
U 1316, 0019,0014,6580,09E0,0000,1317   ;2701           RC[0C]_D+K[.10]                 ; ...
U 1317, 0018,0038,A580,0A80,0000,106C   ;2702           R[0]_K[.60]                     ; INIT ADDRESS OF EXPECTED DATA
U 106C, 0818,0039,D980,0800,0000,11AA   ;2703   =0      D_K[.9],CALL,J/DC0              ; GEN ADDRESS OF OPCODES
U 106D, 0001,003C,0180,0A88,0000,1318   ;2704           R[1]_D                          ; SAVE
                                        ;2705
                                        ;2706   ;///////////////////////////////////////////////////////////////////
                                        ;2707   ;+
                                        ;2708   ; START THE TEST
                                        ;2709   ;-
                                        ;2710
                                        ;2711   T2S1:
U 1318, 0000,003C,0180,0A00,0200,1319   ;2712   T11EL1: VA_R[0]                         ; LOAD ADDRESS OF EXP DATA
U 1319, 0000,803C,0180,C800,0000,131A   ;2713           D[BYTE]_CACHE.P                 ; READ EXPECTED DATA
U 131A, 0019,0034,4980,09F0,0000,106E   ;2714           RC[0E]_D.AND.K[.FF]             ; SAVE
U 106E, 0000,003D,0180,0800,0000,11A5   ;2715   =0      ERLOOP
U 106F, 0810,0038,0180,0970,0000,1070   ;2716           D_RC[0E]                        ; PUT EXPECTED VALUE IN D REG
U 1070, 2000,003D,0180,0A08,4200,11C5   ;2717   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; START THE I BUFFER
U 1071, 1000,003C,0180,0800,0000,1072   ;2718           IBC7STOP                        ; STOP THE I BUFF
U 1072, 0000,003D,0180,0800,0000,11C4   ;2719   =0      CALL,J/DISPAT                   ; EXECUTE THE CALL 3
U 1073, 001D,A000,0180,0800,0010,131B   ;2720           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE RESULT
U 131B, 0000,013C,0180,0800,0000,1074   ;2721           Z?                              ; BRANCH IF OK
U 1074, 0001,203D,0180,09E8,0000,11A8   ;2722   =0      ERROR2,RC[0D]_Q                 ; OP CODE BRANCHED WRONG
                                        ;2723
                                        ;2724   ;+
                                        ;2725   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS TEST
                                        ;2726   ;-
                                        ;2727
U 1075, 0000,003C,0180,0880,0000,131C   ;2728           LA_RA[0]                        ; READ ADDRESS OF EXP DATA
U 131C, 0018,0014,0580,0A80,0000,131D   ;2729           R[0]_LA+K[.1]                   ; INCREMENT THE ADDRESS
U 131D, 0000,003C,0180,0888,0000,131E   ;2730           LA_RA[1]                        ; READ ADDRESS OF OP CODES
U 131E, 0018,0014,1180,0A88,0000,131F   ;2731           R[1]_LA+K[.4]                   ; INCREMENT TO NEXT OP CODE
U 131F, 0810,0038,0180,0960,0000,1320   ;2732           D_RC[0C]                        ; GET THE LOOP COUNT
U 1320, 0019,8000,0580,09E0,0010,1321   ;2733           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 1321, 0000,013C,0180,0800,0000,1076   ;2734           Z?                              ; BRANCH IF FINISHED
U 1076, 0000,003C,0180,0800,0000,1318   ;2735   =0      J/T11EL1                        ; CONTINUE LOOPING
U 1077, 0000,003C,0180,0800,0000,1078   ;2736           NOP
                                        ;2737
                                        ;2738   ;THE FOLLOWING IS THE EXPECTED ADDRESSES FOR THE ABOVE TEST:
                                        ;2739   ;% 60
                                        ;2740   ;$ 8E8F,8C8D,8A8B,8889,CE82,CE82,8587,8381,4F4D,444E
                                        ;2741   ;$ 4640,C442,84C0,A980,2FAF,2EAE,0604,1F02,0800,0A0C,0B09,0F0D,1B19
                                        ;2742   ;
                                        ;2743   ;FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:
                                        ;2744   ;% 90
                                        ;2745   ; LOOP COUNT STARTS AT 2E
                                        ;2746   ;$ 0000,0000
```

```
;2747   ;$ 0001,0000
;2748   ;$ 0002,0000
;2749   ;$ 0003,0000
;2750   ;$ 0004,0000
;2751   ;$ 0005,0000
;2752   ;$ 0006,0000
;2753   ;$ 0007,0000
;2754   ;$ 0010,0000
;2755   ;$ 0011,0000
;2756   ;$ 0030,0000
;2757   ;$ 0031,0000
;2758   ;$ 0057,0000
;2759   ;$ 00FD,0000
;2760   ;$ 00FE,0000
;2761   ; LOOP COUNT STARTS AT 1F
;2762   ;$ 00FF,0000
;2763   ;$ 507C,0000
;2764   ;$ 5094,0000
;2765   ;$ 50DC,0000
;2766   ;$ 5040,0050
;2767   ;$ 0040,0050
;2768   ;$ 5060,0050
;2769   ;$ 0060,0050
;2770   ;$ 5080,0050
;2771   ;$ 0080,0050
;2772   ;$ 5091,0050
;2773   ;$ 0091,0050
;2774   ;$ 5053,0000
;2775   ;$ 5095,0000
;2776   ;$ 5096,0000
;2777   ;$ 50E8,0000
;2778   ; LOOP COUNT STARTS AT 0F
;2779   ;$ 50F4,0000
;2780   ;$ 5044,0050
;2781   ;$ 5064,0050
;2782   ;$ 007D,0000
;2783   ;$ 8F7D,0000
;2784   ;$ 0090,0060
;2785   ;$ 6090,0050
;2786   ;$ 4090,6060
;2787   ;$ 7090,0050
;2788   ;$ 8090,0050
;2789   ;$ 9090,0050
;2790   ;$ A090,0000
;2791   ;$ B090,0000
;2792   ;$ 8F90,0050
;2793   ;$ 9F90,0050
;2794
;2795
```

```
                                         ;2796   .PAGE   "TEST 11F       'A FORK' BRANCH OPCODES DECODE"
                                         ;2797   ;*********************************************************************
                                         ;2798   ;++
                                         ;2799   ; TEST  11F     "A FORK" BRANCH DECODES
                                         ;2800   ;
                                         ;2801   ; TEST DESCRIPTION
                                         ;2802   ;       THIS TEST CHECKS THE BRANCH INSTRUCTION DECODE ON THE A FORK.
                                         ;2803   ;       THIS IS DONE BY LOADING THE IB WITH THE OPCODE, LOADING THE
                                         ;2804   ;       CONDITION CODES, AND EXECUTING THE SUB/SPEC AND CHECK THE ADDRESS.
                                         ;2805   ;       FOLLOWING IS A TABLE OF THE OPCODES, CONDITION CODE VALUES,
                                         ;2806   ;       AND EXPECTED A FORK ADDRESS, FOR THIS TEST:
                                         ;2807   ;
                                         ;2808   ;       INSTR   ADDRESS CC'S            INSTR   ADDRESS CC'S
                                         ;2809   ;       -----   ------- ----            -----   ------- ----
                                         ;2810   ;
                                         ;2811   ;       BGTRU   C8      1000            BGEQ    C8      0111
                                         ;2812   ;       BGEQU   C8      0110            BVC     C8      1000
                                         ;2813   ;       BNEQ    C8      0101            BGTR    C8      1000
                                         ;2814   ;       BGTRU   C9      0001            BGTRU   C9      0100
                                         ;2815   ;       BGEQ    C9      1000            BVC     C9      0010
                                         ;2816   ;       BNEQ    CA      0101            BGTR    CA      1000
                                         ;2817   ;       BEQL    CC      0000
                                         ;2818   ;
                                         ;2819   ;       SUBTST 1 - CHECK THOSE INSTRUCTIONS THAT GO TO ADDRESS C8
                                         ;2820   ;       SUBTST 2 - CHECK THOSE INSTRUCTIONS THAT GO TO ADDRESS C9
                                         ;2821   ;       SUBTST 3 - CHECK THOSE INSTRUCTIONS THAT GO TO ADDRESS CA
                                         ;2822   ;       SUBTST 4 - CHECK THOSE INSTRUCTIONS THAT GO TO ADDRESS CC
                                         ;2823   ; LOGIC DESCRIPTION
                                         ;2824   ;       THIS TEST CHECKS THE VAX DECODE PROMS, THE BRANCH COND 0, 1, AND
                                         ;2825   ;       2 SIGNALS, AND THE BRANCH COND INPUTS TO THE DECODE ADDRESS GATES.
                                         ;2826   ;
                                         ;2827   ; ERROR DESCRIPTION
                                         ;2828   ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                         ;2829   ;             RECEIVED MICRO PC BITS <7:0>
                                         ;2830   ;             LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY UNDER TEST,
                                         ;2831   ;               (SEE THE DATA TABLE AT THE END OF THIS TEST)
                                         ;2832   ;
                                         ;2833   ; SYNC POINT DESCRIPTION
                                         ;2834   ;       ADDRESS SYNC00--MICRO PC BITS ARE VALID AT THE INSTRUCTION FOLLOWING
                                         ;2835   ;                       THIS ONE.
                                         ;2836   ;--
                                         ;2837   ;*********************************************************************
                                         ;2838   =0
U 1078, 0018,0039,0D80,09F8,0000,1191    ;2839   T11F:   NEWTST[.3]
U 1079, 0000,003C,0180,0800,0000,107A    ;2840           NOP
U 107A, 0818,0039,0580,0800,0000,11AF    ;2841   =0      D_K[.1],CALL,J/DC5              ; GEN ADR OF COND CODE DATA
U 107B, 0000,003C,0180,0800,0000,107C    ;2842           NOP
U 107C, 0000,003D,0180,0800,0000,11AA    ;2843   =0      CALL,J/DC0                      ; ...
U 107D, 0001,003C,0180,0A80,0000,107E    ;2844           R[0]_D                          ; SAVE
U 107E, 0818,0039,0580,0800,0000,1180    ;2845   =0      D_K[.1],CALL,J/DC6              ; GEN ADR OF EXPECTED ADDRESSES
U 107F, 0000,003C,0180,0800,0000,1080    ;2846           NOP
U 1080, 0000,003D,0180,0800,0000,11AA    ;2847   =0      CALL,J/DC0                      ; ...
U 1081, 0001,003C,0180,0A90,0000,1322    ;2848           R[2]_D                          ; SAVE
U 1322, 0019,0014,1180,0A88,0000,1323    ;2849           R[1]_D+K[.4]                    ; INIT ADDRESS OF OP CODES
U 1323, 0018,0038,05C0,0800,0000,1324    ;2850           Q_K[.1]
```

```
U 1324, 0000,003C,6580,0800,0084,7325   ;2851           SC_K[.10]                       ; GEN MASK
U 1325, 0001,2014,0180,0980,0000,1082   ;2852           RC[0]_Q+MASK                    ; FOR CC DATA
                                        ;2853
                                        ;2854   ;//////////////////////////////////////////////////////////////////////
                                        ;2855   ;+
                                        ;2856   ; START THE TEST
                                        ;2857   ;-
                                        ;2858
                                        ;2859   =0
U 1082, 0000,003D,0180,0800,0000,11BF   ;2860   T11FS1: SUBTEST
U 1083, 0018,0038,D580,09E0,0000,1084   ;2861           RC[OC]_K[.6]                    ; INIT THE LOOP COUNT
U 1084, 0000,003D,0180,0800,0000,11A5   ;2862   =0      ERLOOP
U 1085, 0000,003C,0180,0A10,0200,1326   ;2863   T11FL1: VA_R[2]                         ; FETCH EXP ADDRESS
U 1326, 0000,803C,0180,C800,0000,1327   ;2864           D[BYTE]_CACHE.P                 ; ...
U 1327, 0019,0034,4980,09F0,0000,1086   ;2865           RC[OE]_D.AND.K[.FF]             ; SAVE
U 1086, 2000,003D,0180,0A08,4200,11C5   ;2866   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 1087, 0000,003C,0180,0A00,0200,1328   ;2867           VA_R[0]
U 1328, 0000,803C,0180,C900,0000,1329   ;2868           D[BYTE]_CACHE.P,LC_RC[0]        ; FETCH CC'S
U 1329, 0811,0024,0180,0800,0000,132A   ;2869           D_D.ANDNOT.LC                   ; MASK
U 132A, 0000,003C,3DF0,2C00,0000,132B   ;2870           Q_ID[PSL]                       ; READ THE PSL
U 132B, 0019,2024,61C0,0800,0000,132C   ;2871           Q_Q.ANDNOT.K[.F]                ; MASK PSL
U 132C, 081D,0030,0180,0800,0000,132D   ;2872           D_D.OR.Q                        ; OR IN CC'S
U 132D, 0810,0038,3D80,3D70,0000,1088   ;2873           ID[PSL]_D,D_RC[OE]              ; LOAD THE CC'S
U 1088, 0000,003D,0180,0800,0000,11C4   ;2874   =0      CALL,J/DISPAT                   ; EXECUTE THE CALL 3
U 1089, 001D,A000,0180,0800,0010,132E   ;2875           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 132E, 0800,013C,0180,0A08,0000,108A   ;2876           Z?,D_R[1]                       ; BRANCH IF YES
U 108A, 0001,A03D,0180,09E8,0000,11A8   ;2877   =0      ERROR2,RC[OD]_Q,BYTE
U 108B, 0800,003C,0180,0A08,0000,132F   ;2878           D_R[1]
                                        ;2879
                                        ;2880   ;+
                                        ;2881   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;2882   ;-
                                        ;2883
U 132F, 0019,0014,0580,0A88,0000,1330   ;2884           R[1]_D+K[.1]                    ; INCREMENT ADR OF OP CODES
U 1330, 0000,003C,0180,0A00,0000,1331   ;2885           LAB_R[0]
U 1331, 0018,0014,0580,0A80,0000,1332   ;2886           R[0]_LA+K[.1]                   ; INCREMENT ADR OF CC'S
U 1332, 0810,0038,0180,0960,0000,1333   ;2887           D_RC[OC]
U 1333, 0019,8000,0580,09E0,0010,1334   ;2888           RC[OC]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 1334, 0000,013C,0180,0800,0000,108C   ;2889           Z?                              ; BRANCH IF LOOP DONE
U 108C, 0000,003C,0180,0800,0000,1085   ;2890   =0      J/T11FL1                        ; CONTINUE TESTING
                                        ;2891
                                        ;2892
                                        ;2893   ;//////////////////////////////////////////////////////////////////////
                                        ;2894   ;+
                                        ;2895   ; NOW CHECK MICRO ADDRESS C9
                                        ;2896   ;-
                                        ;2897
U 108D, 0000,003C,0180,0A10,0000,108E   ;2898   T11FS2: LAB_R[2]
U 108E, 0000,003D,0180,0800,0000,11BF   ;2899   =0      SUBTEST
U 108F, 0018,0014,0580,0A90,0000,1335   ;2900           R[2]_LA+K[.1]                   ; INCREMENT ADR OF EXP ADRS
U 1335, 0018,0038,1180,09E0,0000,1090   ;2901           RC[OC]_K[.4]                    ; SET LOOP COUNT
U 1090, 0000,003D,0180,0800,0000,11A5   ;2902   =0      ERLOOP
U 1091, 0000,003C,0180,0A10,0200,1336   ;2903   T11FL2: VA_R[2]                         ; FETCH EXP ADDRESS
U 1336, 0000,803C,0180,C800,0000,1337   ;2904           D[BYTE]_CACHE.P                 ; ...
U 1337, 0019,0034,4980,09F0,0000,1092   ;2905           RC[OE]_D.AND.K[.FF]             ; SAVE
```

```
U 1092, 2000,003D,0180,0A08,4200,11C5   ;2906   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 1093, 0000,003C,0180,0A00,0200,1338   ;2907           VA_R[0]
U 1338, 0000,803C,0180,C900,0000,1339   ;2908           D[BYTE]_CACHE.P,LC_RC[0]        ; FETCH CC'S
U 1339, 0811,0024,0180,0800,0000,133A   ;2909           D_D.ANDNOT.LC                   ; MASK
U 133A, 0000,003C,3DF0,2C00,0000,133B   ;2910           Q_ID[PSL]                       ; READ THE PSL
U 133B, 0019,2024,61C0,0800,0000,133C   ;2911           Q_Q.ANDNOT.K[.F]                ; MASK THE PSL
U 133C, 081D,0030,0180,0800,0000,133D   ;2912           D_D.OR.Q                        ; INSERT CC'S
U 133D, 0810,0038,3D80,3D70,0000,1094   ;2913           ID[PSL]_D,D_RC[0E]              ; LOAD THE CC'S
U 1094, 0000,003D,0180,0800,0000,11C4   ;2914   =0      CALL,J/DISPAT                   ; EXECUTE THE CALL 3
U 1095, 001D,A000,0180,0800,0010,133E   ;2915           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 133E, 0800,013C,0180,0A08,0000,1096   ;2916           Z?,D_R[1]                       ; BRANCH IF YES
U 1096, 0001,A03D,0180,09E8,0000,11A8   ;2917   =0      ERROR2,RC[0D]_Q,BYTE
                                        ;2918
                                        ;2919   ;+
                                        ;2920   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;2921   ;-
                                        ;2922
U 1097, 0800,003C,0180,0A08,0000,133F   ;2923           D_R[1]
U 133F, 0019,0014,0580,0A88,0000,1340   ;2924           R[1]_D+K[.1]                    ; INCREMENT ADR OF OP CODES
U 1340, 0000,003C,0180,0A00,0000,1341   ;2925           LAB_R[0]
U 1341, 0018,0014,0580,0A80,0000,1342   ;2926           R[0]_LA+K[.1]                   ; INCREMENT ADR OF CC'S
U 1342, 0810,0038,0180,0960,0000,1343   ;2927           D_RC[0C]
U 1343, 0019,8000,0580,09E0,0010,1344   ;2928           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 1344, 0000,013C,0180,0800,0000,1098   ;2929           Z?                              ; BRANCH IF LOOP DONE
U 1098, 0000,003C,0180,0800,0000,1091   ;2930   =0      J/T11FL2                        ; CONTINUE TESTING
                                        ;2931
                                        ;2932
                                        ;2933   ;///////////////////////////////////////////////////////////////////
                                        ;2934   ;+
                                        ;2935   ; NOW CHECK MICRO ADDRESS CA
                                        ;2936   ;-
                                        ;2937
U 1099, 0000,003C,0180,0A10,0000,109A   ;2938   T11FS3: LAB_R[2]
U 109A, 0000,003D,0180,0800,0000,11BF   ;2939   =0      SUBTEST
U 109B, 0018,0014,0580,0A90,0000,1345   ;2940           R[2]_LA+K[.1]                   ; INCREMENT ADR OF EXP ADDRESS
U 1345, 0018,0038,0980,09E0,0000,109C   ;2941           RC[0C]_K[.2]                    ; SET LOOP COUNT
U 109C, 0000,003D,0180,0800,0000,11A5   ;2942   =0      ERLOOP
U 109D, 0000,003C,0180,0A10,0200,1346   ;2943   T11FL3: VA_R[2]                         ; FETCH EXP ADDRESS
U 1346, 0000,803C,0180,C800,0000,1347   ;2944           D[BYTE]_CACHE.P                 ; ...
U 1347, 0019,0034,4980,09F0,0000,109E   ;2945           RC[0E]_D.AND.K[.FF]             ; SAVE
U 109E, 2000,003D,0180,0A08,4200,11C5   ;2946   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 109F, 0000,003C,0180,0A00,0200,1348   ;2947           VA_R[0]
U 1348, 0000,803C,0180,C900,0000,1349   ;2948           D[BYTE]_CACHE.P,LC_RC[0]        ; FETCH CC'S
U 1349, 0811,0024,0180,0800,0000,134A   ;2949           D_D.ANDNOT.LC                   ; MASK
U 134A, 0000,003C,3DF0,2C00,0000,134B   ;2950           Q_ID[PSL]                       ; READ THE PSL
U 134B, 0019,2024,61C0,0800,0000,134C   ;2951           Q_Q.ANDNOT.K[.F]                ; MASK THE PSL
U 134C, 081D,0030,0180,0800,0000,134D   ;2952           D_D.OR.Q                        ; INSERT CC'S
U 134D, 0810,0038,3D80,3D70,0000,10A0   ;2953           ID[PSL]_D,D_RC[0E]              ; LOAD THE CC'S
U 10A0, 0000,003D,0180,0800,0000,11C4   ;2954   =0      CALL,J/DISPAT                   ; EXECUTE THE CALL 3
U 10A1, 001D,A000,0180,0800,0010,134E   ;2955           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 134E, 0800,013C,0180,0A08,0000,10A2   ;2956           Z?,D_R[1]                       ; BRANCH IF YES
U 10A2, 0001,A03D,0180,09E8,0000,11A8   ;2957   =0      ERROR2,RC[0D]_Q,BYTE
                                        ;2958
                                        ;2959   ;+
                                        ;2960   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
```

```
                                            ;2961   ;-
                                            ;2962
U 10A3, 0800,003C,0180,0A08,0000,134F       ;2963           D_R[1]
U 134F, 0019,0014,0580,0A88,0000,1350       ;2964           R[1]_D+K[.1]                    ; INCREMENT ADR OF OP CODES
U 1350, 0000,003C,0180,0A00,0000,1351       ;2965           LAB_R[0]
U 1351, 0018,0014,0580,0A80,0000,1352       ;2966           R[0]_LA+K[.1]                   ; INCREMENT ADR OF CC'S
U 1352, 0810,0038,0180,0960,0000,1353       ;2967           D_RC[0C]
U 1353, 0019,8000,0580,09E0,0010,1354       ;2968           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 1354, 0000,013C,0180,0800,0000,10A4       ;2969           Z?                              ; BRANCH IF LOOP DONE
U 10A4, 0000,003C,0180,0800,0000,109D       ;2970   =0      J/T11FL3                        ; CONTINUE TESTING
                                            ;2971
                                            ;2972
                                            ;2973   ;///////////////////////////////////////////////////////////////////////
                                            ;2974   ;+
                                            ;2975   ; NOW CHECK MICRO ADDRESS CC
                                            ;2976   ;-
                                            ;2977
U 10A5, 0000,003C,0180,0A10,0000,10A6       ;2978   T11FS4: LAB_R[2]
U 10A6, 0000,003D,0180,0800,0000,11BF       ;2979   =0      SUBTEST
U 10A7, 0018,0014,0580,0A90,0000,10A8       ;2980           R[2]_LA+K[.1]                   ; INCREMENT ADR OF EXP ADDRESS
U 10A8, 0000,003D,0180,0800,0000,11A5       ;2981   =0      ERLOOP
U 10A9, 0000,003C,0180,0A10,0200,1355       ;2982           VA_R[2]                         ; FETCH EXP ADDRESS          .
U 1355, 0000,803C,0180,C800,0000,1356       ;2983           D[BYTE]_CACHE.P                 ; ...
U 1356, 0019,0034,4980,09F0,0000,10AA       ;2984           RC[0E]_D.AND.K[.FF]             ; SAVE
U 10AA, 2000,003D,0180,0A08,4200,11C5       ;2985   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 10AB, 0000,003C,0180,0A00,0200,1357       ;2986           VA_R[0]
U 1357, 0000,803C,0180,C900,0000,1358       ;2987           D[BYTE]_CACHE.P,LC_RC[0]        ; FETCH CC'S
U 1358, 0811,0024,0180,0800,0000,1359       ;2988           D_D.ANDNOT.LC                   ; MASK
U 1359, 0000,003C,3DF0,2C00,0000,135A       ;2989           Q_ID[PSL]                       ; READ THE PSL
U 135A, 0019,2024,61C0,0800,0000,135B       ;2990           Q_Q.ANDNOT.K[.F]                ; MASK THE PSL
U 135B, 081D,0030,0180,0800,0000,135C       ;2991           D_D.OR.Q                        ; INSERT CC'S
U 135C, 0810,0038,3D80,3D70,0000,10AC       ;2992           ID[PSL]_D,D_RC[0E]              ; LOAD THE CC'S
U 10AC, 0000,003D,0180,0800,0000,11C4       ;2993   =0      CALL,J/DISPAT                   ; EXECUTE THE CALL 3
U 10AD, 001D,A000,0180,0800,0010,135D       ;2994           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 135D, 0800,013C,0180,0A08,0000,10AE       ;2995           Z?,D_R[1]                       ; BRANCH IF YES
U 10AE, 0001,A03D,0180,09E8,0000,11A6       ;2996   =0      ERROR1,RC[0D]_Q,BYTE            ; BRANCH DECODE FAILED
U 10AF, 0000,003C,0180,0800,0000,10B0       ;2997           NOP
                                            ;2998
                                            ;2999
                                            ;3000
                                            ;3001   ; THE FOLLOWING IS THE CONDITION CODE DATA FOR THE ABOVE TEST:
                                            ;3002   ;% 150
                                            ;3003   ; SUBTEST 1
                                            ;3004   ;$ 0708,0806,0008
                                            ;3005   ; SUBTEST 2
                                            ;3006   ;$ 0401,0208
                                            ;3007   ; SUBTEST 3
                                            ;3008   ;$ 0805
                                            ;3009   ; SUBTEST 4
                                            ;3010   ;$ 0000
                                            ;3011   ;
                                            ;3012   ; THE FOLLOWING IS THE EXP ADDRESS FOR THE ABOVE TEST:
                                            ;3013   ;% 160
                                            ;3014   ;$ C9C8,CCCA
                                            ;3015   ;
```

```
;3016   ; THE FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:
;3017   ;% 164
;3018   ; SUBTEST 1
;3019   ;$ 181A,1C1E,1412
;3020   ; SUBTEST 2
;3021   ;$ 1A1A,1C18
;3022   ; SUBTEST 3
;3023   ;$ 1412
;3024   ; SUBTEST 4
;3025   ;$ 0013
;3026
;3027
```

```
                                            .PAGE   "TEST 120       SELECT SPECIFIER LOGIC"
                                            ;************************************************************************
                                            ;++
                                            ; TEST  120     SELECT SPECIFIER LOGIC
                                            ;
                                            ; TEST DESCRIPTION
                                            ;       THIS TEST CHECKS THE LOGIC THAT GENERATES THE DECODE ADDRESS
                                            ;       WHEN THE OPCODE REQUIRES A SELECT SPECIFIER DECODE RATHER THAN
                                            ;       AN EXECUTE DECODE. THIS IS DONE BY LOADING THE IB WITH THE OPCODE,
                                            ;       EXECUTING THE SUB/SPEC FUNCTION, AND CHECKING THE ADDRESS.
                                            ;
                                            ;       SUBTST 1 - CHECK THOSE OPCODES THAT CAN BE TESTED AT EXECUTION
                                            ;                  POINT 0
                                            ;       SUBTST 2 - CHECK THOSE OPCODES THAT REQUIRE THE EXECUTION POINT
                                            ;                  COUNTER TO BE AT 1.
                                            ;
                                            ; LOGIC DESCRIPTION
                                            ;       THIS TEST CHECKS THE LOGIC THAT DRIVES THE SELECT SPECIFIER INPUTS
                                            ;       TO THE DECODE ADDRESS GATES ON THE IFC MODULE.
                                            ;
                                            ; ERROR DESCRIPTION
                                            ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                            ;             RECEIVED MICRO PC BITS <7:0>
                                            ;             LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY IN THE
                                            ;               IB. (SEE THE DATA TABLE AT THE END OF THIS TEST).
                                            ;
                                            ; SYNC POINT DESCRIPTION
                                            ;       ADDRESS SYNC00--MICRO PC BITS ARE ACTIVE AT THE INSTRUCTION FOLLOWING
                                            ;                       THIS ONE.
                                            ;--
                                            ;************************************************************************
                                            =0
U 10B0, 0018,0039,0D80,09F8,0000,1191       T120:   NEWTST[.3]
U 10B1, 0000,003C,0180,0800,0000,10B2               NOP
U 10B2, 0818,0039,7D80,0800,0000,11AA       =0      D_K[.18],CALL,J/DC0             ; GEN ADR OF IB DATA
U 10B3, 0001,003C,0180,0A88,0000,10B4               R[1]_D                          ; SAVE
U 10B4, 0818,0039,0D80,0800,0000,11AC       =0      D_K[.3],CALL,J/DC2              ; GEN ADR OF EXPECTED ADDRESSES
U 10B5, 0000,003C,0180,0800,0000,10B6               NOP
U 10B6, 0000,003D,0180,0800,0000,11AA       =0      CALL,J/DC0                      ; ...
U 10B7, 0001,003C,0180,0A80,0000,10B8               R[0]_D                          ; SAVE

                                            ;////////////////////////////////////////////////////////////////////////
                                            ;+
                                            ; CHECK THOSE OPCODES AND SPECIFIERS THAT REQUIRE THE EP COUNTER TO BE 0
                                            ;-

                                            =0
U 10B8, 0000,003D,0180,0800,0000,11BF       T120S1: SUBTEST
U 10B9, 0818,0038,7980,0800,0000,135E               D_K[.30]                        ; SET THE LOOP COUNT
U 135E, 0000,003C,D580,0800,0000,135F               KMX/.6
U 135F, 0019,0014,D580,09E0,0000,1360               RC[0C]_D+K[.6]                  ; EQUALS 36(16)
U 1360, 0000,003C,0180,0A00,0200,1361       T120L1: VA_R[0]                         ; LOAD ADDRESS OF EXPECTED ADDRESS
U 1361, 0000,803C,0180,C800,0000,1362               D[BYTE]_CACHE.P                 ; READ IT
U 1362, 0019,0034,4980,09F0,0000,10BA               RC[0E]_D.AND.K[.FF]             ; SAVE
U 10BA, 0000,003D,0180,0800,0000,11A5       =0      ERLOOP
```

```
U 10BB, 0810,0038,0180,0970,0000,10BC   ;3083           D_RC[OE]                        ; GET EXP ADDRESS
U 10BC, 2000,003D,0180,0A08,4200,11C5   ;3084   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 10BD, 0000,003C,0180,0800,0000,10BE   ;3085           NOP
U 10BE, 0000,003D,0180,0800,0000,11C4   ;3086   =0      CALL,J/DISPAT                   ; EXECUTE THE CALL 3
U 10BF, 001D,A000,0180,0800,0010,1363   ;3087           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 1363, 0800,013C,0180,0A08,0000,10C0   ;3088           Z?,D_R[1]                       ; BRANCH IF YES
U 10C0, 0001,A03D,0180,09E8,0000,11A8   ;3089   =0      ERROR2,RC[OD]_Q,BYTE            ; ERROR
U 10C1, 0800,003C,0180,0A08,0000,1364   ;3090           D_R[1]
U 1364, 0019,0014,1180,0A88,0000,1365   ;3091           R[1]_D+K[.4]                    ; INCREMENT ADDRESS OF IB DATA
U 1365, 0000,003C,0180,0A00,0000,1366   ;3092           LAB_R[0]
U 1366, 0018,0014,0580,0A80,0000,1367   ;3093           R[0]_LA+K[.1]                   ; INCREMENT ADR OF EXP ADDRESS
U 1367, 0810,0038,0180,0960,0000,1368   ;3094           D_RC[OC]
U 1368, 0019,8000,0580,09E0,0010,1369   ;3095           RC[OC]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP CNT AND CHECK
U 1369, 0000,013C,0180,0800,0000,10C2   ;3096           Z?                              ; BRANCH IF DONE
U 10C2, 0000,003C,0180,0800,0000,1360   ;3097   =0      J/T120L1
                                        ;3098
                                        ;3099   ;//////////////////////////////////////////////////////////////////////
                                        ;3100   ;+
                                        ;3101   ; CHECK THOSE SPECIFIERS THAT REQUIRE THE EP COUNTER TO BE AT 1
                                        ;3102   ;-
                                        ;3103
U 10C3, 0818,0038,6580,0800,0000,136A   ;3104   T120S2: D_K[.10]
U 136A, 0019,0014,0980,09E0,0000,10C4   ;3105           RC[OC]_D+K[.2]                  ; SET THE LOOP COUNT
U 10C4, 0000,003D,0180,0800,0000,10C5   ;3106   =0      SUBTEST
U 10C5, 0000,003C,0180,0A00,0200,136B   ;3107   T120L2: VA_R[0]                         ; LOAD ADDRESS OF EXPECTED ADDRESS
U 136B, 0000,803C,0180,C800,0000,136C   ;3108           D[BYTE]_CACHE.P                 ; READ IT
U 136C, 0019,0034,4980,09F0,0000,10C6   ;3109           RC[OE]_D.AND.K[.FF]             ; SAVE
U 10C6, 0000,003D,0180,0800,0000,11A5   ;3110   =0      ERLOOP
U 10C7, 0810,0038,0180,0970,0000,10C8   ;3111           D_RC[OE]                        ; GET EXP ADDRESS
U 10C8, 2000,003D,0180,0A08,4200,11C5   ;3112   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 10C9, D000,003C,0180,0800,0000,10CA   ;3113           IBC7CLR.1                       ; GO TO EXECT PNT 1
U 10CA, 0000,003D,0180,0800,0000,11C4   ;3114   =0      CALL,J/DISPAT                   ; EXECUTE THE CALL 3
U 10CB, 001D,A000,0180,0800,0010,136D   ;3115           ALU_Q-D,CLK.UBCC,BYTE           ; ADDRESS OK?
U 136D, 0800,013C,0180,0A08,0000,10CC   ;3116           Z?,D_R[1]                       ; BRANCH IF YES
U 10CC, 0001,A03D,0180,09E8,0000,11A8   ;3117   =0      ERROR2,RC[OD]_Q,BYTE            ; ERROR
U 10CD, 0800,003C,0180,0A08,0000,136E   ;3118           D_R[1]
U 136E, 0019,0014,1180,0A88,0000,136F   ;3119           R[1]_D+K[.4]                    ; INCREMENT ADDRESS OF IB DATA
U 136F, 0000,003C,0180,0A00,0000,1370   ;3120           LAB_R[0]
U 1370, 0018,0014,0580,0A80,0000,1371   ;3121           R[0]_LA+K[.1]                   ; INCREMENT ADR OF EXP ADDRFSS
U 1371, 0810,0038,0180,0960,0000,1372   ;3122           D_RC[OC]
U 1372, 0019,8000,0580,09E0,0010,1373   ;3123           RC[OC]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP CNT AND CHECK
U 1373, 0000,013C,0180,0800,0000,10CE   ;3124           Z?                              ; BRANCH IF DONE
U 10CE, 0000,003C,0180,0800,0000,10C5   ;3125   =0      J/T120L2
U 10CF, 0000,003C,0180,0800,0000,10D0   ;3126           NOP
                                        ;3127
                                        ;3128
                                        ;3129   ; THE FOLLOWING IS THE IB DATA FOR TEST 1A:
                                        ;3130   ;% 180
                                        ;3131   ; SUBTEST 1, LOOP COUNT STARTS AT 36
                                        ;3132   ;$ 1041,0000
                                        ;3133   ;$ 4016,0000
                                        ;3134   ;$ 1016,0000
                                        ;3135   ;$ C016,0000
                                        ;3136   ;$ 3F84,0000
                                        ;3137   ;$ 5084,0000
```

```
;3138   ;$ 6064,0000
;3139   ; SUBTEST 1, LOOP COUNT STARTS AT 2F
;3140   ;$ 8084,0000
;3141   ;$ 00A4,0000
;3142   ;$ 00C4,0000
;3143   ;$ 7084,0000
;3144   ;$ 9084,0000
;3145   ;$ 8F64,0000
;3146   ;$ 2064,0000
;3147   ;$ 6F64,0000
;3148   ;$ 2084,0000
;3149   ;$ 8FA4,0000
;3150   ;$ 8FC4,0000
;3151   ;$ 9F64,0000
;3152   ;$ 8E64,0000
;3153   ;$ 8D64,0000
;3154   ;$ 8B64,0000
;3155   ;$ 8764,0000
;3156   ; SUBTEST 1, LOOP COUNT STARTS AT 1F
;3157   ;$ 4084,0000
;3158   ;$ A084,0000
;3159   ;$ 8F64,0000
;3160   ;$ B084,0000
;3161   ;$ CF64,0000
;3162   ;$ 6094,0000
;3163   ;$ 6090,0050
;3164   ;$ 5090,0060
;3165   ;$ 5084,0050
;3166   ;$ 50D9,0050
;3167   ;$ 5090,0050
;3168   ;$ 5091,0050
;3169   ;$ 0090,0050
;3170   ;$ 5040,0050
;3171   ;$ 5084,0050
;3172   ;$ 0F90,0000
;3173   ; SUBTEST 1, LOOP COUNT STARTS AT 0F
;3174   ;$ 0F7D,0000
;3175   ;$ 5F90,0000
;3176   ;$ 6F90,0000
;3177   ;$ 7F90,0000
;3178   ;$ 5F7D,0000
;3179   ;$ 6F7D,0000
;3180   ;$ 7F7D,0000
;3181   ;$ 0016,0000
;3182   ;$ 0F16,0000
;3183   ;$ 007E,0000
;3184   ;$ 0F7E,0000
;3185   ;$ 007C,0000
;3186   ;$ 0F7C,0000
;3187   ;$ 0096,0000
;3188   ;$ 0F96,0000
;3189   ;
;3190   ; SUBTEST 2, LOOP COUNT STARTS AT 12
;3191   ;$ 4016,0070
;3192   ;$ 4084,0040
```

```
;$ 4084,0020
; SUBTEST 2, LOOP COUNT STARTS AT OF
;$ 00E0,0020
;$ 003E,0000
;$ 503E,0050
;$ 5041,5050
;$ 4090,5050
;$ 0094,0000
;$ 0F94,0000
;$ 4090,0050
;$ 4090,005F
;$ 407D,0050
;$ 407D,005F
;$ 4090,0020
;$ 407D,0020
;$ 4090,006F
;$ 4090,007F
;
; THE FOLLOWING IS THE EXPECTED ADDRESS FOR TEST 1A:
;% 320
;$ 0C00,0D01,0400,0908,0000,0B0A,021F,0018,1919,091B,0909,0C09,1F0D
;$ 0D0F,084F,0404,C4C4,C084,0444
;
;$ 0200,1814,161A,1A18,0101,0303,4D4D,0101
;
;$ 1D0A,0101,2401,1544
;
;$ 0101,1515,1717,0301,1A18
;
```

```
                                      ;3222   .PAGE   "TEST 121       'B FORK' OPCODE DECODES"
                                      ;3223   ;*******************************************************************
                                      ;3224   ;++
                                      ;3225   ; TEST  121      'B FORK'' OP CODE DECODES
                                      ;3226   ;
                                      ;3227   ; TEST DESCRIPTION
                                      ;3228   ;       THIS TEST EXECUTES ALL THE OPCODES THAT HAVE ENTRY POINTS ON THE
                                      ;3229   ;       B FORK. THIS IS DONE BY LOADING THE IB WITH THE OPCODE, EXECUTING
                                      ;3230   ;       A CLR BYTE 1 TO ADVANCE THE EP COUNTER TO EP 1, EXECUTING THE
                                      ;3231   ;       SUB/SPEC FUNCTION, AND CHECKING THE ADDRESS.
                                      ;3232   ;       FOLLOWING IS A TABLE OF THE OPCODES AND EXPECTED ADDRESS FOR THIS
                                      ;3233   ;       TEST.
                                      ;3234   ;
                                      ;3235   ;       INSTR   ADDRESS                 INSTR   ADDRESS
                                      ;3236   ;       -----   -------                 -----   -------
                                      ;3237   ;
                                      ;3238   ;       CVTWL   4C                      CVTWB   4B
                                      ;3239   ;       MOVZWL  4A                      PUSHAW  48
                                      ;3240   ;       ADDF2   2F                      CVTFE   45
                                      ;3241   ;       CVTBF   4F                      MOVF    85
                                      ;3242   ;       TSTF    8D                      CVTFD   47
                                      ;3243   ;       CVTDB   43                      ADDD2   2E
                                      ;3244   ;       ADDB2   27                      CMPB    AF
                                      ;3245   ;       CVTBD   CC                      CVTDF   CD
                                      ;3246   ;       MNEGB   49                      MOVD    41
                                      ;3247   ;       TSTB    4D                      INCB    4E
                                      ;3248   ;       BBS     A8                      AOBLSS  23
                                      ;3249   ;       BLBS    CF                      SOBGEQ  CE
                                      ;3250   ;       BISPSW  8B                      POPR    8A
                                      ;3251   ;       PUSHR   89                      CHMK    88
                                      ;3252   ;       MFPR    C7                      ADDF3   44
                                      ;3253   ;       ADDF3   40                      ADDD3   46
                                      ;3254   ;       ADDD3   42                      BICW3   C4
                                      ;3255   ;       BICW3   C0                      JMP     8E
                                      ;3256   ;       JSB     8F                      REMQUE  84
                                      ;3257   ;
                                      ;3258   ; LOGIC DESCRIPTION
                                      ;3259   ;       THIS TEST CHECKS MORE OF THE VAX DECODE ROMS ON THE IRC MODULE.
                                      ;3260   ;
                                      ;3261   ; ERROR DESCRIPTION
                                      ;3262   ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                      ;3263   ;             RECEIVED MICRO PC BITS <7:0>
                                      ;3264   ;             LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY IN THE
                                      ;3265   ;               IB, I.E. DC=CVTWL , DD=CVTWB, DE=MOVZWL, DF=PUSHAW, ETC.
                                      ;3266   ;
                                      ;3267   ; SYNC POINT DESCRIPTION
                                      ;3268   ;       ADDRESS SYNC00--MICRO PC BITS ARE ACTIVE AT THE INSTRUCTION
                                      ;3269   ;                       FOLLOWING THIS ONE.
                                      ;3270   ;--
                                      ;3271   ;*******************************************************************
                                      ;3272   =0
U 10D0, 0018,0039,0D80,09F8,0000,1191  ;3273   T121:   NEWTST[.3]
U 10D1, 0818,0038,8980,0800,0000,10D2  ;3274           D_K[.D]                         ; GEN LOOP COUNT= DC(16)
U 10D2, 0000,003D,0180,0800,0000,11B6  ;3275   =0      CALL,J/DCC
U 10D3, 0001,003C,0180,09E0,0000,10D4  ;3276           RC[0C]_D
```

```
U 10D4, 0818,0039,0D80,0800,0000,11B1   ;3277   =0      D_K[.3],CALL,J/DC7              ; GEN ADR OF EXP DATA
U 10D5, 0000,003C,0180,0800,0000,10D6   ;3278           NOP
U 10D6, 0000,003D,0180,0800,0000,11B2   ;3279   =0      CALL,J/DC8                      ; EQUALS 378(16)
U 10D7, 0001,003C,0180,0A80,0000,10D8   ;3280           R[0]_D                          ; SAVE
U 10D8, 0818,0039,0D80,0800,0000,11B4   ;3281   =0      D_K[.3],CALL,J/DCA              ; GEN ADR OF IB DATA
U 10D9, 0000,003C,0180,0800,0000,10DA   ;3282           NOP
U 10DA, 0000,003D,0180,0800,0000,11AA   ;3283   =0      CALL,J/DC0                      ; ...
U 10DB, 0001,003C,0180,0A88,0000,1374   ;3284           R[1]_D                          ; SAVE
                                        ;3285
                                        ;3286   ;/////////////////////////////////////////////////////////////////////
                                        ;3287   ;+
                                        ;3288   ; START THE TEST
                                        ;3289   ;-
                                        ;3290
                                        ;3291   T121S1:
U 1374, 0000,003C,0180,0A00,0200,1375   ;3292   T121L1: VA_R[0]                         ; LOAD ADDRESS OF EXPECTED DATA
U 1375, 0000,803C,0180,C800,0000,1376   ;3293           D[BYTE]_CACHE.P                 ; READ THE EXPECTED DATA
U 1376, 0019,0034,4980,09F0,0000,10DC   ;3294           RC[0E]_D.AND.K[.FF]             ; SAVE
U 10DC, 0000,003D,0180,0800,0000,11A5   ;3295   =0      ERLOOP
U 10DD, 0810,0038,0180,0970,0000,10DE   ;3296           D_RC[0E]                        ; PUT EXPECTED VALUE IN D REG
U 10DE, 2000,003D,0180,0A08,4200,11C5   ;3297   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; START THE I BUFFER
U 10DF, D000,003C,0180,0800,0000,10E0   ;3298           IBC7CLR.1                       ; ADVANCE THE EXECUTION POINT COUNTER
U 10E0, 0000,003D,0180,0800,0000,11C4   ;3299   =0      CALL,J/DISPAT                   ; GO TO THE B FORK
U 10E1, 001D,A000,0180,0800,0010,1377   ;3300           ALU_Q-D,CLK.UBCC,BYTE           ; IS THE ADDRESS OK?
U 1377, 0000,013C,0180,0800,0000,10E2   ;3301           Z?                              ; BRANCH IF YES
U 10E2, 0001,A03D,0180,09E8,0000,11A8   ;3302   =0      ERROR2,RC[0D]_Q,BYTE            ; B FORK FAILED
                                        ;3303
U 10E3, 0000,003C,0180,0880,0000,1378   ;3304           LA_RA[0]                        ; READ ADDRESS OF EXP DATA
U 1378, 0018,0014,0580,0A80,0000,1379   ;3305           R[0]_LA+K[.1]                   ; INCREMENT THE ADDRESS
U 1379, 0000,003C,0180,0888,0000,137A   ;3306           LA_RA[1]                        ; READ ADDRESS OF OP CODES
U 137A, 0018,0014,1180,0A88,0000,137B   ;3307           R[1]_LA+K[.4]                   ; INCREMENT TO NEXT OP CODE
U 137B, 0810,0038,0180,0960,0000,137C   ;3308           D_RC[0C]                        ; GET THE LOOP COUNT
U 137C, 0019,8014,0580,09E0,0010,137D   ;3309           RC[0C]_D+K[.1],CLK.UBCC,BYTE    ; INCREMENT LOOP COUNT
U 137D, 0000,013C,0180,0800,0000,10E4   ;3310           Z?                              ; BRANCH IF FINISHED
U 10E4, 0000,003C,0180,0800,0000,1374   ;3311   =0      J/T121L1                        ; CONTINUE LOOPING
U 10E5, 0000,003C,0180,0800,0000,10E6   ;3312           NOP
                                        ;3313
                                        ;3314   ;THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                        ;3315   ;% 378
                                        ;3316   ;$ 4B4C,484A,452F,854F,478D,2E43,AF27,CDCC,4149
                                        ;3317   ;$ 4E4D,23A8,CECF,8A8B,8889,44C7,4640,C442,8EC0,848F
                                        ;3318   ;
                                        ;3319   ;THE FOLLOWING ARE THE OP CODE FOR THE ABOVE TEST:
                                        ;3320   ;% 3A0
                                        ;3321   ; LOOP COUNT STARTS AT DC
                                        ;3322   ;$ 5032,0050
                                        ;3323   ;$ 5033,0050
                                        ;3324   ;$ 503C,0050
                                        ;3325   ;$ 603F,0000
                                        ;3326   ; LOOP COUNT STARTS AT E0
                                        ;3327   ;$ 6040,0050
                                        ;3328   ;$ 5048,0050
                                        ;3329   ;$ 504C,0050
                                        ;3330   ;$ 5050,0050
                                        ;3331   ;$ 6053,0000
```

```
;3332   ;$ 5056,0050
;3333   ;$ 5068,0050
;3334   ;$ 6060,0050
;3335   ;$ 6080,0050
;3336   ;$ 6091,0050
;3337   ;$ 506C,0050
;3338   ;$ 5076,0050
;3339   ;$ 608E,0050
;3340   ;$ 5070,0050
;3341   ;$ 6095,0000
;3342   ;$ 6096,0000
;3343   ; LOOP COUNT STARTS AT FO
;3344   ;$ 50E0,0050
;3345   ;$ 50F2,0050
;3346   ;$ 60E8,0000
;3347   ;$ 60F4,0000
;3348   ;$ 50B8,0000
;3349   ;$ 50BA,0000
;3350   ;$ 50BB,0000
;3351   ;$ 50BC,0000
;3352   ;$ 50DB,0050
;3353   ;$ 6041,5050
;3354   ;$ 6041,5000
;3355   ;$ 6061,5050
;3356   ;$ 6061,5000
;3357   ;$ 60AB,5050
;3358   ;$ 60AB,5000
;3359   ;$ 6017,0000
;3360   ;$ 6016,0000
;3361   ;$ 500F,0050
;3362
;3363
```

```
.PAGE   "TEST 122       'C FORK' OPCODE DECODES"
;*************************************************************************
;++
; TEST  122     "C FORK" OP CODE DECODES
;
; TEST DESCRIPTION
;       THIS TEST CHECKS ALL THE OPCODES THAT HAVE ENTRY POINTS ON THE
;       C FORK. THIS IS DONE BY LOADING THE IB WITH THE OPCODE, EXECUTING
;       TWO CLR BYTE 1'S, EXECUTING THE SUB/SPEC FUNCTION, AND CHECKING
;       THE ADDRESS.
;       FOLLOWING IS A TABLE OF THE OPCODES AND THE EXPECTED ADDRESSES
;       FOR THIS TEST:
;
;       INSTR   ADDRESS                 INSTR   ADDRESS
;       -----   -------                 -----   -------
;
;       CRC     C0                      PROBER  CE
;       INSQUE  CF                      REMQUE  01
;       ADDN6   CA                      SUBNC   C4
;       MULN    CB                      DIVN    CD
;       MOVTC   C3                      MOVTUC  C3
;       CVTNL   40                      EDITN   C6
;       ACBW    C4                      ADDF2   8E
;       MULF2   8F                      DIVF2   8D
;       ACBF    C5                      CMPF    C1
;       EMODF   C8                      POLYF   87
;       ADDD2   8A                      MULD2   8C
;       DIVD2   8B                      ACBD    84
;       CMPD    82                      EMODD   86
;       POLYD   85                      ASHL    4C
;       ASHQ    43                      EMUL    89
;       EDIV    88                      ADDB2   4B
;       ADDB3   4A                      MULB2   81
;       DIVB2   80                      CASEB   83
;       CMPB    49                      ROTL    4D
;       CASEL   0E                      MTPR    47
;       BBS     45                      EXTZV   4E
;       INSV    48                      AOBLSS  46
;       CVTLB   86                      CVTLN   42
;       CALLG   4F
;
; LOGIC DESCRIPTION
;       THIS TEST CHECKS MORE OF THE VAX DECODE PROMS
;
; ERROR DESCRIPTION
;       DATA: EXPECTED MICRO PC BITS <7:0>
;             RECEIVED MICRO PC BITS <7:0>
;             LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY IN THE IB
;               I.E. D1=CRC, D2=PROBER, D3=INSQUE, D4=REMQUE, ETC.
;
; SYNC POINT DESCRIPTION
;       ADDRESS SYNC00--MICRO PC BITS ARE ACTIVE AT THE INSTRUCTION
;                       FOLLOWING THIS ONE.
;--
;*************************************************************************
```

```
                                        ;3419   =0
U 10E6, 0018,0039,0D80,09F8,0000,1191   ;3420   T122:   NEWTST[.3]
U 10E7, 0818,0038,7580,0800,0000,137E   ;3421           D_K[.20]                        ; SET THE LOOP COUNT -47(10)
U 137E, 081F,2000,6180,0800,0000,137F   ;3422           D_0-D,KMX/.F
U 137F, 0019,0000,6180,09E0,0000,10E8   ;3423           RC[0C]_D-K[.F]
U 10E8, 0818,0039,1180,0800,0000,11AD   ;3424   =0      D_K[.4],CALL,J/DC3              ; GEN ADR OF EXPECTED DATA
U 10E9, 0000,003C,0180,0800,0000,10EA   ;3425           NOP
U 10EA, 0000,003D,0180,0800,0000,11B2   ;3426   =0      CALL,J/DC8
U 10EB, 0001,003C,0180,0A80,0000,10EC   ;3427           R[0]_D                          ; EQUALS 438
U 10EC, 0818,0039,1180,0800,0000,11B0   ;3428   =0      D_K[.4],CALL,J/DC6              ; GEN ADR OF IB DATA
U 10ED, 0000,003C,0180,0800,0000,10EE   ;3429           NOP
U 10EE, 0000,003D,0180,0800,0000,11B2   ;3430   =0      CALL,J/DC8                      ; ...
U 10EF, 0001,003C,0180,0A88,0000,1380   ;3431           R[1]_D                          ; SAVE
                                        ;3432
                                        ;3433   ;//////////////////////////////////////////////////////////////////////
                                        ;3434   ;+
                                        ;3435   ; START THE TEST
                                        ;3436   ;-
                                        ;3437
                                        ;3438   T122S1:
U 1380, 0000,003C,0180,0A00,0200,1381   ;3439   T122L1: VA_R[0]                         ; LOAD ADDRESS OF EXPECTED DATA
U 1381, 0000,803C,0180,C800,0000,1382   ;3440           D[BYTE]_CACHE.P                 ; READ THE EXPECTED DATA
U 1382, 0019,0034,4980,09F0,0000,10F0   ;3441           RC[0E]_D.AND.K[.FF]             ; SAVE
U 10F0, 0000,003D,0180,0800,0000,11A5   ;3442   =0      ERLOOP
U 10F1, 0810,0038,0180,0970,0000,10F2   ;3443           D_RC[0E]                        ; PUT EXPECTED VALUE IN D REG
U 10F2, 2000,003D,0180,0A08,4200,11C5   ;3444   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; START THE IB
U 10F3, D000,003C,0180,0800,0000,1383   ;3445           IBC7CLR.1                       ; ADVANCE THE EXECUTION POINT COUNTER
U 1383, D000,003C,0180,0800,0000,10F4   ;3446           IBC/CLR.1                       ; ADVANCE THE EXECUTION POINT COUNTER
U 10F4, 0000,003D,0180,0800,0000,11C4   ;3447   =0      CALL,J/DISPAT                   ; EXECUTE THE C FORK
U 10F5, 001D,A000,0180,0800,0010,1384   ;3448           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 1384, 0000,013C,0180,0800,0000,10F6   ;3449           Z?                              ; BRANCH IF OK
U 10F6, 0001,A03D,0180,09E8,0000,11A8   ;3450   =0      ERROR2,RC[0D]_Q,BYTE            ; C FORK FAILED
                                        ;3451
U 10F7, 0000,003C,0180,0880,0000,1385   ;3452           LA_RA[0]                        ; READ ADDRESS OF EXP DATA
U 1385, 0018,0014,0580,0A80,0000,1386   ;3453           R[0]_LA+K[.1]                   ; INCREMENT THE ADDRESS
U 1386, 0000,003C,0180,0888,0000,1387   ;3454           LA_RA[1]                        ; READ ADDRESS OF OP CODES
U 1387, 0018,0014,0180,0A88,0000,1388   ;3455           R[1]_LA+K[.8]                   ; INCREMENT TO NEXT OP CODE
U 1388, 0810,0038,0180,0960,0000,1389   ;3456           D_RC[0C]                        ; GET THE LOOP COUNT
U 1389, 0019,8014,0580,09E0,0010,138A   ;3457           RC[0C]_D+K[.1],CLK.UBCC,BYTE    ; INCREMENT LOOP COUNT
U 138A, 0000,013C,0180,0800,0000,10F8   ;3458           Z?                              ; BRANCH IF FINISHED
U 10F8, 0000,003C,0180,0800,0000,1380   ;3459   =0      J/T122L1                        ; CONTINUE LOOPING
U 10F9, 0000,003C,0180,0800,0000,10FA   ;3460           NOP
                                        ;3461
                                        ;3462
                                        ;3463   ;THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                        ;3464   ;% 438
                                        ;3465   ;$ CEC0,01CF,CACA,CDCB,C3C3,C640,8EC4,8D8F,C1C5,87C8
                                        ;3466   ;$ 8C8A,848B,8682,4C85,8943,4B88,814A,8380,4D49,470E,4E45
                                        ;3467   ;$ 4648,4286,004F
                                        ;3468   ;
                                        ;3469   ;THE FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:
                                        ;3470   ;% 468
                                        ;3471   ; LOOP COUNT STARTS AT D1
                                        ;3472   ;$ 600B,5050,5060,0000
                                        ;3473   ;$ 500C,6050,0000,0000
```

```
;3474     ;$ 600E,0060,0000,0000
;3475     ;$ 600F,0050,0000,0000
;3476     ;$ 6021,6050,6050,0050
;3477     ;$ 6023,6050,6050,0050
;3478     ;$ 6025,6050,6050,0050
;3479     ;$ 6027,6050,6050,0050
;3480     ;$ 602E,6050,6050,0050
;3481     ;$ 602F,6050,6050,0050
;3482     ;$ 5036,5060,0000,0000
;3483     ;$ 5038,5060,5060,0060
;3484     ;$ 503D,5050,0000,0000
;3485     ;$ 6040,0060,0000,0000
;3486     ;$ 5044,0050,0000,0000
;3487     ; LOOP COUNT STARTS AT E0
;3488     ;$ 5046,0050,0000,0000
;3489     ;$ 504F,5050,0000,0000
;3490     ;$ 5051,0050,0000,0000
;3491     ;$ 5054,5050,5050,0000
;3492     ;$ 5055,6050,0050,0000
;3493     ;$ 6060,0060,0000,0000
;3494     ;$ 5064,0050,0000,0000
;3495     ;$ 5066,0050,0000,0000
;3496     ;$ 506F,5050,0000,0000
;3497     ;$ 5071,0050,0000,0000
;3498     ;$ 5074,5050,5050,0000
;3499     ;$ 5075,6050,0050,0000
;3500     ;$ 5078,5050,0000,0000
;3501     ;$ 5079,5050,0000,0000
;3502     ;$ 507A,5050,0050,0000
;3503     ;$ 507B,5050,0050,0000
;3504     ; LOOP COUNT STARTS AT F0
;3505     ;$ 6080,0060,0000,0000
;3506     ;$ 5081,5060,0000,0000
;3507     ;$ 5084,0050,0000,0000
;3508     ;$ 5086,0050,0000,0000
;3509     ;$ 508F,5050,0000,0000
;3510     ;$ 6091,0060,0000,0000
;3511     ;$ 509C,5050,0000,0000
;3512     ;$ 50CF,5050,0000,0000
;3513     ;$ 50DA,0050,0000,0000
;3514     ;$ 50E0,0060,0000,0000
;3515     ;$ 50EF,5050,0050,0000
;3516     ;$ 50F0,5050,0050,0000
;3517     ;$ 50F2,0060,0000,0000
;3518     ;$ 50F6,0050,0000,0000
;3519     ;$ 50F9,6050,0000,0000
;3520     ;$ 60FA,0060,0000,0000
;3521
;3522
```

```
                                        ;3523   .PAGE   "TEST 123       D MUX SELECT AND DATA INTEGRITY"
                                        ;3524   ;**********************************************************************
                                        ;3525   ;++
                                        ;3526   ; TEST  123     D MUX SELECT AND DATA INTEGRITY
                                        ;3527   ;
                                        ;3528   ; TEST DESCRIPTION
                                        ;3529   ;       THIS TEST CHECKS THE FUNCTIONALITY OF THE D MULTIPLEXOR BY LOADING
                                        ;3530   ;       THE IB WITH AN OPCODE FOLLOWED BY A SPECIFIC DATA PATTERN AND READING
                                        ;3531   ;       THE D MUX OUTPUT AND CHECKING IT.
                                        ;3532   ;       THE DESCRIPTION AT THE BEGINNING OF EACH SUBTEST SHOWS THE LOGIC
                                        ;3533   ;       EQUATION FOR THE TEST CONDIITON BEING INVOKED.
                                        ;3534   ;
                                        ;3535   ;       SUBTST 1 - BYTE 0 SEL=0, BYTE 1 SEL=0, BYTE 23 SEL=0
                                        ;3536   ;       SUBTST 2 - BYTE 0 SEL=1, BYTE 1 SEL=0, BYTE 23 SEL=0
                                        ;3537   ;       SUBTST 3 - BYTE 0 SEL=2, BYTE 1 SEL=0, BYTE 23 SEL=0
                                        ;3538   ;       SUBTST 4 - BYTE 0 SEL=1, BYTE 2 SEL=1, BYTE 23 SEL=0
                                        ;3539   ;       SUBTST 5 - BYTE 0 SEL=2, BYTE 1 SEL=2, BYTE 23 SEL=0
                                        ;3540   ;       SUBTST 6 - BYTE 0 SEL=2, BYTE 1 SEL=2, BYTE 23 SEL=1
                                        ;3541   ;       SUBTST 7 - BYTE 0 SEL=2, BYTE 1 SEL=2, BYTE 23 SEL=0
                                        ;3542   ;       SUBTST 8 - BYTE 0 SEL=2, BYTE 1 SEL=2, BYTE 23 SEL=1
                                        ;3543   ;       SUBTST 9 - BYTE 0 SEL=3, BYTE 1 SEL=3, BYTE 23 SEL=0
                                        ;3544   ;
                                        ;3545   ; LOGIC DESCRIPTION
                                        ;3546   ;       THIS TEST CHECKS THE LOGIC THAT GENERATES THE D MULTIPLEXOR
                                        ;3547   ;       SLECT LINES ON THE IDP AND IRC MODULES, AND THE D MULTIPLEXOR
                                        ;3548   ;       ITSELF ON THE IDP MODULE.
                                        ;3549   ;
                                        ;3550   ; ERROR DESCRIPTION
                                        ;3551   ;       DATA: EXPECTED D MUX OUTPUT
                                        ;3552   ;             RECEIVED D MUX OUTPUT
                                        ;3553   ;
                                        ;3554   ; SYNC POINT DESCRIPTION
                                        ;3555   ;       SUBTST 1 - SYNC07--D MUX IS READ ONTO THE ID BUS
                                        ;3556   ;       SUBTST 2 - SYNC08--D MUX IS READ ONTO THE ID BUS
                                        ;3557   ;       SUBTST 3 - SYNC09--D MUX IS READ ONTO THE ID BUS
                                        ;3558   ;       SUBTST 4 - SYNC0A--D MUX IS READ ONTO THE ID BUS
                                        ;3559   ;       SUBTST 5 - SYNC0B--D MUX IS READ ONTO THE ID BUS
                                        ;3560   ;       SUBTST 6 - SYNC0C--D MUX IS READ ONTO THE ID BUS
                                        ;3561   ;       SUBTST 7 - SYNC0D--D MUX IS READ ONTO THE ID BUS
                                        ;3562   ;       SUBTST 8 - SYNC0E--D MUX IS READ ONTO THE ID BUS
                                        ;3563   ;       SUBTST 9 - SYNC0F--D MUX IS READ ONTO THE ID BUS
                                        ;3564   ;--
                                        ;3565   ;**********************************************************************
                                        ;3566   =0
U 10FA, 0018,0039,0980,09F8,0000,1191   ;3567   T123:   NEWTST[.2]
U 10FB, 0818,0038,1180,0800,0000,10FC   ;3568           D_K[.4]
U 10FC, 0819,0015,0580,0800,0000,11B8   ;3569   =0      D_D+K[.1],CALL,J/DCE            ; GEN ADR OF IB DATA
U 10FD, 0000,003C,0180,0800,0000,10FE   ;3570           NOP
U 10FE, 0000,003D,0180,0800,0000,11B2   ;3571   =0      CALL,J/DC8                      ; ...
U 10FF, 0001,003C,0180,0A88,0000,110A   ;3572           R[1]_D
U 110A, 0818,0039,D580,0800,0000,11AF   ;3573   =0      D_K[.6],CALL,J/DC5              ; GEN ADR OF EXPECTED DATA
U 110B, 0000,003C,0180,0800,0000,1110   ;3574           NOP
U 1110, 0000,003D,0180,0800,0000,11B2   ;3575   =0      CALL,J/DC8                      ; ...
U 1111, 0001,003C,0180,0A80,0000,1112   ;3576           R[0]_D
                                        ;3577
```

```
                                          ;3578    ;////////////////////////////////////////////////////////////////////
                                          ;3579    ;+
                                          ;3580    ; B0 SEL=00  -BDEST*-SHTLIT*-SEL BYTE*-16BITBDEST*-SEL WORD
                                          ;3581    ; B1 SEL=00  -16BITBDEST*-FP*SHTLIT*-SEL WORD*-(PCMODE*-BYTE)
                                          ;3582    ; B23=0      -SEL LONG*-PCMODE*(LONG+QUAD)
                                          ;3583    ;-
                                          ;3584
                                          ;3585    =0
U 1112, 0000,003D,0180,0800,0000,11BF    ;3586    T123S1:  SUBTEST
U 1113, 0018,0038,0980,0A90,0000,138B    ;3587             R[2]_K[.2]                      ; SET LOOP COUNT
U 138B, 0000,003C,0180,0A00,0200,138C    ;3588    T123L1:  VA_R[0]                         ; LOAD ADDRESS OF EXP DATA
U 138C, 0000,003C,0180,C800,0000,138D    ;3589             D[LONG]_CACHE.P                 ; READ EXPECTED DATA
U 138D, 0001,003C,0180,09F0,0000,1114    ;3590             RC[0E]_D                        ; SAVE
U 1114, 0000,003D,0180,0800,0000,11A5    ;3591    =0       ERLOOP
U 1115, 1810,0038,0180,0970,0000,1116    ;3592             D_RC[0E],IBC/STOP               ; GET EXP DATA
U 1116, 2000,003D,0180,0A08,4200,11C5    ;3593    =0       ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 1117, 0000,003C,01F0,2C00,0000,138E    ;3594    SYNC07:  Q_ID[IBUF]                      ; READ THE D MUX
U 138E, 001D,2000,0180,0800,0010,138F    ;3595             ALU_Q-D,CLK.UBCC                ; DATA OK?
U 138F, 0800,013C,D580,0A08,0000,1118    ;3596             Z?,D_R[1],KMX/.6                ; BRANCH IF YES
U 1118, 0001,203D,0180,09E8,0000,11A6    ;3597    =0       ERROR1,RC[0D]_Q                 ; D MUX FAILED
U 1119, 0019,0014,D580,0A88,0000,1390    ;3598             R[1]_D+K[.6]                    ; INCREMENT ADR OF IB DATA
U 1390, 0000,003C,0180,0A00,0000,1391    ;3599             LAB_R[0]
U 1391, 0018,0014,1180,0A80,0000,1392    ;3600             R[0]_LA+K[.4]                   ; INCREMENT ADR OF EXP DATA
U 1392, 0000,003C,0180,0A10,0000,1393    ;3601             LAB_R[2]
U 1393, 0018,8000,0580,0A90,0010,1394    ;3602             R[2]_LA-K[.1],CLK.UBCC,BYTE     ; DECREMENT LOOP COUNT
U 1394, 0000,013C,0180,0800,0000,111A    ;3603             Z?                              ; BRANCH IF DONE
U 111A, 0000,003C,0180,0800,0000,138B    ;3604    =0       J/T123L1                                ; CONTINUE
                                          ;3605
                                          ;3606
                                          ;3607    ;////////////////////////////////////////////////////////////////////
                                          ;3608    ;+
                                          ;3609    ; B0 SEL=01  SHTLIT*-SEL BYTE*-16BITBDEST
                                          ;3610    ; B1 SEL=00  -16BITBDEST*-FP*SHTLIT*-SEL WORD*-(PCMODE*-BYTE)
                                          ;3611    ; B23=0      -SEL LONG*-PCMODE*(LONG+QUAD)
                                          ;3612    ;-
                                          ;3613
U 111B, 0018,0038,0980,0A90,0000,111C    ;3614    T123S2:  R[2]_K[.2]                      ; SET LOOP COUNT
U 111C, 0000,003D,0180,0800,0000,11BF    ;3615    =0       SUBTEST
U 111D, 0000,003C,0180,0A00,0200,1395    ;3616    T123L2:  VA_R[0]                         ; LOAD ADDRESS OF EXP DATA
U 1395, 0000,003C,0180,C800,0000,1396    ;3617             D[LONG]_CACHE.P                 ; READ EXPECTED DATA
U 1396, 0001,003C,0180,09F0,0000,111E    ;3618             RC[0E]_D                        ; SAVE
U 111E, 0000,003D,0180,0800,0000,11A5    ;3619    =0       ERLOOP
U 111F, 0810,0038,0180,0970,0000,1120    ;3620             D_RC[0E]                        ; GET EXP DATA
U 1120, 2000,003D,0180,0A08,4200,11C5    ;3621    =0       ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 1121, 0000,003C,01F0,2C00,0000,1397    ;3622    SYNC08:  Q_ID[IBUF]                      ; READ THE D MUX
U 1397, 001D,2000,0180,0800,0010,1398    ;3623             ALU_Q-D,CLK.UBCC                ; DATA OK?
U 1398, 0800,013C,D580,0A08,0000,1122    ;3624             Z?,D_R[1],KMX/.6                ; BRANCH IF YES
U 1122, 0001,203D,0180,09E8,0000,11A6    ;3625    =0       ERROR1,RC[0D]_Q                 ; D MUX FAILED
U 1123, 0019,0014,D580,0A88,0000,1399    ;3626             R[1]_D+K[.6]                    ; INCREMENT ADR OF IB DATA
U 1399, 0000,003C,0180,0A00,0000,139A    ;3627             LAB_R[0]
U 139A, 0018,0014,1180,0A80,0000,139B    ;3628             R[0]_LA+K[.4]                   ; INCREMENT ADR OF EXP DATA
U 139B, 0000,003C,0180,0A10,0000,139C    ;3629             LAB_R[2]
U 139C, 0018,8000,0580,0A90,0010,139D    ;3630             R[2]_LA-K[.1],CLK.UBCC,BYTE     ; DECREMENT LOOP COUNT
U 139D, 0000,013C,0180,0800,0000,1124    ;3631             Z?                              ; BRANCH IF DONE
U 1124, 0000,003C,0180,0800,0000,111D    ;3632    =0       J/T123L2                        ; CONTINUE
```

```


                                                ;//////////////////////////////////////////////////////////////////////
                                                ;+
                                                ; B0 SEL=10  -BDEST*-SHTLIT*SEL BYTE*-16BITBDEST
                                                ; B1 SEL=00  -16BITBDEST*-FP*SHTLIT*-SEL WORD*-(PCMODE*-BYTE)
                                                ; B23=0      -SEL LONG*-PCMODE*(LONG+QUAD)
                                                ;-

                                                T123S3:
U 1125, 0018,0038,0980,0A90,0000,1126                   R[2]_K[.2]                         ; SET LOOP COUNT
U 1126, 0000,003D,0180,0800,0000,11BF           =0      SUBTEST
U 1127, 0000,003C,0180,0A00,0200,139E           T123L3: VA_R[0]                            ; LOAD ADDRESS OF EXP DATA
U 139E, 0000,003C,0180,C800,0000,139F                   D[LONG]_CACHE.P                    ; READ EXPECTED DATA
U 139F, 0001,003C,0180,09F0,0000,1128                   RC[0E]_D                           ; SAVE
U 1128, 0000,003D,0180,0800,0000,11A5           =0      ERLOOP
U 1129, 0810,0038,0180,0970,0000,112A                   D_RC[0E]                           ; GET EXP DATA
U 112A, 2000,003D,0180,0A08,4200,11C5           =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT    ; LOAD THE IBUFFER
U 112B, 0000,003C,01F0,2C00,0000,13A0           SYNC09: Q_ID[IBUF]                         ; READ THE D MUX
U 13A0, 001D,2000,0180,0800,0010,13A1                   ALU_Q-D,CLK.UBCC                   ; DATA OK?
U 13A1, 0800,013C,D580,0A08,0000,112C                   Z?,D_R[1],KMX/.6                   ; BRANCH IF YES
U 112C, 0001,203D,0180,09E8,0000,11A6           =0      ERROR1,RC[0D]_Q                    ; D MUX FAILED
U 112D, 0019,0014,D580,0A88,0000,13A2                   R[1]_D+K[.6]                       ; INCREMENT ADR OF IB DATA
U 13A2, 0000,003C,0180,0A00,0000,13A3                   LAB_R[0]
U 13A3, 0018,0014,1180,0A80,0000,13A4                   R[0]_LA+K[.4]                      ; INCREMENT ADR OF EXP DATA
U 13A4, 0000,003C,0180,0A10,0000,13A5                   LAB_R[2]
U 13A5, 0018,8000,0580,0A90,0010,13A6                   R[2]_LA-K[.1],CLK.UBCC,BYTE        ; DECREMENT LOOP COUNT
U 13A6, 0000,013C,0180,0800,0000,112E                   Z?                                 ; BRANCH IF DONE
U 112E, 0000,003C,0180,0800,0000,1127           =0      J/T123L3                           ; CONTINUE


                                                ;//////////////////////////////////////////////////////////////////////
                                                ;+
                                                ; B0 SEL=01  BDEST*SEL BYTE*16BITBDEST
                                                ; B1 SEL=01  16BITBDEST*-SEL WORD*-(PCMODE*-BYTE)
                                                ; B23=0      -SEL LONG*-PCMODE*(LONG+QUAD)
                                                ;-

                                                T123S4:
U 112F, 0018,0038,0980,0A90,0000,1130                   R[2]_K[.2]                         ; SET LOOP COUNT
U 1130, 0000,003D,0180,0800,0000,11BF           =0      SUBTEST
U 1131, 0000,003C,0180,0A00,0200,13A7           T123L4: VA_R[0]                            ; LOAD ADDRESS OF EXP DATA
U 13A7, 0000,003C,0180,C800,0000,13A8                   D[LONG]_CACHE.P                    ; READ EXPECTED DATA
U 13A8, 0001,003C,0180,09F0,0000,1132                   RC[0E]_D                           ; SAVE
U 1132, 0000,003D,0180,0800,0000,11A5           =0      ERLOOP
U 1133, 0810,0038,0180,0970,0000,1134                   D_RC[0E]                           ; GET EXP DATA
U 1134, 2000,003D,0180,0A08,4200,11C5           =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT    ; LOAD THE IBUFFER
U 1135, 0000,003C,01F0,2C00,0000,13A9           SYNC0A: Q_ID[IBUF]                         ; READ THE D MUX
U 13A9, 001D,2000,0180,0800,0010,13AA                   ALU_Q-D,CLK.UBCC                   ; DATA OK?
U 13AA, 0800,013C,D580,0A08,0000,1136                   Z?,D_R[1],KMX/.6                   ; BRANCH IF YES
U 1136, 0001,203D,0180,09E8,0000,11A6           =0      ERROR1,RC[0D]_Q                    ; D MUX FAILED
U 1137, 0019,0014,D580,0A88,0000,13AB                   R[1]_D+K[.6]                       ; INCREMENT ADR OF IB DATA
U 13AB, 0000,003C,0180,0A00,0000,13AC                   LAB_R[0]
U 13AC, 0018,0014,1180,0A80,0000,13AD                   R[0]_LA+K[.4]                      ; INCREMENT ADR OF EXP DATA
U 13AD, 0000,003C,0180,0A10,0000,13AE                   LAB_R[2]
```

```
U 13AE, 0018,8000,0580,0A90,0010,13AF   ;3688           R[2]_LA-K[.1],CLK.UBCC,BYTE     ; DECREMENT LOOP COUNT
U 13AF, 0000,013C,0180,0800,0000,1138   ;3689           Z?                              ; BRANCH IF DONE
U 1138, 0000,003C,0180,0800,0000,1131   ;3690   =0      J/T123L4                        ; CONTINUE
                                        ;3691
                                        ;3692
                                        ;3693   ;/////////////////////////////////////////////////////////////////////
                                        ;3694   ;+
                                        ;3695   ; B0 SEL=10  -BDEST*-SHTLIT*SEL BYTE*-16BITBDEST
                                        ;3696   ; B1 SEL=10  -16BITBDEST*-FP*SHTLIT*SEL WORD
                                        ;3697   ; B23=0      -SEL LONG*-PCMODE*(LONG+QUAD)
                                        ;3698   ;-
                                        ;3699
                                        ;3700   T123S5:
U 1139, 0018,0038,0980,0A90,0000,113A   ;3701           R[2]_K[.2]                      ; SET LOOP COUNT
U 113A, 0000,003D,0180,0800,0000,11BF   ;3702   =0      SUBTEST
U 113B, 0000,003C,0180,0A00,0200,13B0   ;3703   T123L5: VA_R[0]                         ; LOAD ADDRESS OF EXP DATA
U 13B0, 0000,003C,0180,C800,0000,13B1   ;3704           D[LONG]_CACHE.P                 ; READ EXPECTED DATA
U 13B1, 0001,003C,0180,09F0,0000,113C   ;3705           RC[0E]_D                        ; SAVE
U 113C, 0000,003D,0180,0800,0000,11A5   ;3706   =0      ERLOOP
U 113D, 0810,0038,0180,0970,0000,113E   ;3707           D_RC[0E]                        ; GET EXP DATA
U 113E, 2000,003D,0180,0A08,4200,11C5   ;3708   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 113F, 0000,003C,01F0,2C00,0000,13B2   ;3709   SYNC0B: Q_ID[IBUF]                      ; READ THE D MUX
U 13B2, 001D,2000,0180,0800,0010,13B3   ;3710           ALU_Q-D,CLK.UBCC                ; DATA OK?
U 13B3, 0800,013C,D580,0A08,0000,1140   ;3711           Z?,D_R[1],KMX/.6                ; BRANCH IF YES
U 1140, 0001,203D,0180,09E8,0000,11A6   ;3712   =0      ERROR1,RC[0D]_Q                 ; D MUX FAILED
U 1141, 0019,0014,D580,0A88,0000,13B4   ;3713           R[1]_D+K[.6]                    ; INCREMENT ADR OF IB DATA
U 13B4, 0000,003C,0180,0A00,0000,13B5   ;3714           LAB_R[0]
U 13B5, 0018,0014,1180,0A80,0000,13B6   ;3715           R[0]_LA+K[.4]                   ; INCREMENT ADR OF EXP DATA
U 13B6, 0000,003C,0180,0A10,0000,13B7   ;3716           LAB_R[2]
U 13B7, 0018,8000,0580,0A90,0010,13B8   ;3717           R[2]_LA-K[.1],CLK.UBCC,BYTE     ; DECREMENT LOOP COUNT
U 13B8, 0000,013C,0180,0800,0000,1142   ;3718           Z?                              ; BRANCH IF DONE
U 1142, 0000,003C,0180,0800,0000,113B   ;3719   =0      J/T123L5                        ; CONTINUE
                                        ;3720
                                        ;3721
                                        ;3722   ;/////////////////////////////////////////////////////////////////////
                                        ;3723   ;+
                                        ;3724   ; B0 SEL=10  -BDEST*-SHTLIT*SEL BYTE*-16BITBDEST
                                        ;3725   ; B1 SEL=10  -16BITBDEST*-FP*SHTLIT*SEL WORD
                                        ;3726   ; B23=1      SEL LONG
                                        ;3727   ;-
                                        ;3728
                                        ;3729   T123S6:
U 1143, 0018,0038,0980,0A90,0000,1144   ;3730           R[2]_K[.2]                      ; SET LOOP COUNT
U 1144, 0000,003D,0180,0800,0000,11BF   ;3731   =0      SUBTEST
U 1145, 0000,003C,0180,0A00,0200,13B9   ;3732   T123L6: VA_R[0]                         ; LOAD ADDRESS OF EXP DATA
U 13B9, 0000,003C,0180,C800,0000,13BA   ;3733           D[LONG]_CACHE.P                 ; READ EXPECTED DATA
U 13BA, 0001,003C,0180,09F0,0000,1146   ;3734           RC[0E]_D                        ; SAVE
U 1146, 0000,003D,0180,0800,0000,11A5   ;3735   =0      ERLOOP
U 1147, 0810,0038,0180,0970,0000,1148   ;3736           D_RC[0E]                        ; GET EXP DATA
U 1148, 2000,003D,0180,0A08,4200,11C5   ;3737   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 1149, 0000,003C,01F0,2C00,0000,13BB   ;3738   SYNC0C: Q_ID[IBUF]                      ; READ THE D MUX
U 13BB, 001D,2000,0180,0800,0010,13BC   ;3739           ALU_Q-D,CLK.UBCC                ; DATA OK?
U 13BC, 0800,013C,D580,0A08,0000,114A   ;3740           Z?,D_R[1],KMX/.6                ; BRANCH IF YES
U 114A, 0001,203D,0180,09E8,0000,11A6   ;3741   =0      ERROR1,RC[0D]_Q                 ; D MUX FAILED
U 114B, 0019,0014,D580,0A88,0000,13BD   ;3742           R[1]_D+K[.6]                    ; INCREMENT ADR OF IB DATA
```

```
U 13BD, 0000,003C,0180,0A00,0000,13BE   ;3743           LAB_R[0]
U 13BE, 0018,0014,1180,0A80,0000,13BF   ;3744           R[0]_LA+K[.4]                   ; INCREMENT ADR OF EXP DATA
U 13BF, 0000,003C,0180,0A10,0000,13C0   ;3745           LAB_R[2]
U 13C0, 0018,8000,0580,0A90,0010,13C1   ;3746           R[2]_LA-K[.1],CLK.UBCC,BYTE     ; DECREMENT LOOP COUNT
U 13C1, 0000,013C,0180,0800,0000,114C   ;3747           Z?                              ; BRANCH IF DONE
U 114C, 0000,003C,0180,0800,0000,1145   ;3748   =0      J/T123L6                        ; CONTINUE
                                        ;3749
                                        ;3750
                                        ;3751   ;///////////////////////////////////////////////////////////////////
                                        ;3752   ;+
                                        ;3753   ; B0 SEL=10  -BDEST*-SHTLIT*SEL BYTE*-16BITBDEST
                                        ;3754   ; B1 SEL=10  -16BITBDEST*-FP*SHTLIT*PCMODE*-BYTE
                                        ;3755   ; B23=0      -SEL LONG*-PCMODE*(LONG+QUAD)
                                        ;3756   ;-
                                        ;3757
U 114D, 0000,003C,0180,0800,0000,114E   ;3758   T123S7: NOP
U 114E, 0000,003D,0180,0800,0000,11BF   ;3759   =0      SUBTEST
U 114F, 0000,003C,0180,0A00,0200,13C2   ;3760   T123L7: VA_R[0]                         ; LOAD ADDRESS OF EXP DATA
U 13C2, 0000,003C,0180,C800,0000,13C3   ;3761           D[LONG]_CACHE.P                 ; READ EXPECTED DATA
U 13C3, 0001,003C,0180,09F0,0000,1150   ;3762           RC[0E]_D                        ; SAVE
U 1150, 0000,003D,0180,0800,0000,11A5   ;3763   =0      ERLOOP
U 1151, 0810,0038,0180,0970,0000,1152   ;3764           D_RC[0E]                        ; GET EXP DATA
U 1152, 2000,003D,0180,0A08,4200,11C5   ;3765   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 1153, 0000,003C,01F0,2C00,0000,13C4   ;3766   SYNC0D: Q_ID[IBUF]                      ; READ THE D MUX
U 13C4, 001D,2000,0180,0800,0010,13C5   ;3767           ALU_Q-D,CLK.UBCC                ; DATA OK?
U 13C5, 0800,013C,D580,0A08,0000,1156   ;3768           Z?,D_R[1],KMX/.6                ; BRANCH IF YES
U 1156, 0001,203D,0180,09E8,0000,11A6   ;3769   =0      ERROR1,RC[0D]_Q                 ; D MUX FAILED
U 1157, 0019,0014,D580,0A88,0000,13C6   ;3770           R[1]_D+K[.6]                    ; INCREMENT ADR OF IB DATA
U 13C6, 0000,003C,0180,0A00,0000,13C7   ;3771           LAB_R[0]
U 13C7, 0018,0014,1180,0A80,0000,13C8   ;3772           R[0]_LA+K[.4]                   ; INCREMENT ADR OF EXP DATA
                                        ;3773
                                        ;3774
                                        ;3775   ;///////////////////////////////////////////////////////////////////
                                        ;3776   ;+
                                        ;3777   ; B0 SEL=10  -BDEST*-SHTLIT*SEL BYTE*-16BITBDEST
                                        ;3778   ; B1 SEL=10  -16BITBDEST*-FP*SHTLIT*SEL WORD
                                        ;3779   ; B23=1      PCMODE*(LONG+QUAD)
                                        ;3780   ;-
                                        ;3781
U 13C8, 0000,003C,0180,0800,0000,1158   ;3782   T123S8: NOP
U 1158, 0000,003D,0180,0800,0000,11BF   ;3783   =0      SUBTEST
U 1159, 0000,003C,0180,0A00,0200,13C9   ;3784   T123L8: VA_R[0]                         ; LOAD ADDRESS OF EXP DATA
U 13C9, 0000,003C,0180,C800,0000,13CA   ;3785           D[LONG]_CACHE.P                 ; READ EXPECTED DATA
U 13CA, 0001,003C,0180,09F0,0000,115A   ;3786           RC[0E]_D                        ; SAVE
U 115A, 0000,003D,0180,0800,0000,11A5   ;3787   =0      ERLOOP
U 115B, 0810,0038,0180,0970,0000,115C   ;3788           D_RC[0E]                        ; GET EXP DATA
U 115C, 2000,003D,0180,0A08,4200,11C5   ;3789   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 115D, 0000,003C,01F0,2C00,0000,13CB   ;3790   SYNC0E: Q_ID[IBUF]                      ; READ THE D MUX
U 13CB, 001D,2000,0180,0800,0010,13CC   ;3791           ALU_Q-D,CLK.UBCC                ; DATA OK?
U 13CC, 0800,013C,D580,0A08,0000,115E   ;3792           Z?,D_R[1],KMX/.6                ; BRANCH IF YES
U 115E, 0001,203D,0180,09E8,0000,11A6   ;3793   =0      ERROR1,RC[0D]_Q                 ; D MUX FAILED
U 115F, 0019,0014,D580,0A88,0000,13CD   ;3794           R[1]_D+K[.6]                    ; INCREMENT ADR OF IB DATA
U 13CD, 0000,003C,0180,0A00,0000,13CE   ;3795           LAB_R[0]
U 13CE, 0018,0014,1180,0A80,0000,13CF   ;3796           R[0]_LA+K[.4]                   ; INCREMENT ADR OF EXP DATA
                                        ;3797
```

```
                                             ;3798
                                             ;3799   ;//////////////////////////////////////////////////////////////////
                                             ;3800   ;+
                                             ;3801   ; B0 SEL=11  FP*SHTLIT
                                             ;3802   ; B1 SEL=11  FP*SHTLIT
                                             ;3803   ; B23=0       -SEL LONG*-PCMODE*(LONG+QUAD)
                                             ;3804   ;-
                                             ;3805
                                             ;3806   T123S9:
U 13CF, 0018,0038,0980,0A90,0000,1160        ;3807           R[2]_K[.2]                          ; SET LOOP COUNT
U 1160, 0000,003D,0180,0800,0000,11BF        ;3808   =0      SUBTEST
U 1161, 0000,003C,0180,0A00,0200,13D0        ;3809   T123L9: VA_R[0]                             ; LOAD ADDRESS OF EXP DATA
U 13D0, 0000,003C,0180,C800,0000,13D1        ;3810           D[LONG]_CACHE.P                     ; READ EXPECTED DATA
U 13D1, 0001,003C,0180,09F0,0000,1162        ;3811           RC[0E]_D                            ; SAVE
U 1162, 0000,003D,0180,0800,0000,11A5        ;3812   =0      ERLOOP
U 1163, 0810,0038,0180,0970,0000,1164        ;3813           D_RC[0E]                            ; GET EXP DATA
U 1164, 2000,003D,0180,0A08,4200,11C5        ;3814   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 1165, 0000,003C,01F0,2C00,0000,13D2        ;3815   SYNCOF: Q_ID[IBUF]                          ; READ THE D MUX
U 13D2, 001D,2000,0180,0800,0010,13D3        ;3816           A[U_Q-D,CLK.UBCC                    ; DATA OK?
U 13D3, 0800,013C,D580,0A08,0000,1166        ;3817           Z?,D_R[1],KMX/.6                    ; BRANCH IF YES
U 1166, 0001,203D,0180,09E8,0000,11A6        ;3818   =0      ERROR1,RC[0D]_Q                     ; D MUX FAILED
U 1167, 0019,0014,D580,0A88,0000,13D4        ;3819           R[1]_D+K[.6]                        ; INCREMENT ADR OF IB DATA
U 13D4, 0000,003C,0180,0A00,0000,13D5        ;3820           LAB_R[0]
U 13D5, 0018,0014,1180,0A80,0000,13D6        ;3821           R[0]_LA+K[.4]                       ; INCREMENT ADR OF EXP DATA
U 13D6, 0000,003C,0180,0A10,0000,13D7        ;3822           LAB_R[2]
U 13D7, 0018,8000,0580,0A90,0010,13D8        ;3823           R[2]_LA-K[.1],CLK.UBCC,BYTE         ; DECREMENT LOOP COUNT
U 13D8, 0000,013C,0180,0800,0000,1168        ;3824           Z?                                  ; BRANCH IF DONE
U 1168, 0000,003C,0180,0800,0000,1161        ;3825   =0      J/T123L9                            ; CONTINUE
U 1169, 0000,003C,0180,0800,0000,116A        ;3826           NOP
                                             ;3827
                                             ;3828
                                             ;3829   ; THE FOLLOWING DATA IS THE IBUFFER DATA FOR THE ABOVE TEST:
                                             ;3830   ;% 5F8
                                             ;3831   ;        SUBTEST 1
                                             ;3832   ;$ 5055,8080,FFFF
                                             ;3833   ;$ 50AA,0050,FFFF
                                             ;3834   ;        SUBTEST 2
                                             ;3835   ;$ 15FF,8080,FFFF
                                             ;3836   ;$ 2AFF,8080,FFFF
                                             ;3837   ;        SUBTEST 3
                                             ;3838   ;$ 8F90,0055,FFFF
                                             ;3839   ;$ 8F90,00AA,FFFF
                                             ;3840   ;        SUBTEST 4
                                             ;3841   ;$ AA31,FFAA,FFFF
                                             ;3842   ;$ 5531,FF55,FFFF
                                             ;3843   ;        SUBTEST 5
                                             ;3844   ;$ C090,5555,FFFF
                                             ;3845   ;$ C090,AAAA,FFFF
                                             ;3846   ;        SUBTEST 6
                                             ;3847   ;$ E090,5555,5555
                                             ;3848   ;$ E090,AAAA,AAAA
                                             ;3849   ;        SUBTEST 7
                                             ;3850   ;$ 8FB0,AA55,FFFF
                                             ;3851   ;        SUBTEST 8
                                             ;3852   ;$ 8FD0,AAAA,AAAA
```

```
;3853   ;       SUBTEST 9
;3854   ;$ 1550,FFFF,FFFF
;3855   ;$ 2A50,FFFF,FFFF
;3856   ;
;3857   ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
;3858   ;% 658
;3859   ;$ 00AA,0000,FF54,FFFF
;3860   ;$ 0015,0000,002A,0000
;3861   ;$ 0055,0000,FFAA,FFFF
;3862   ;$ AAAA,FFFF,5555,00000
;3863   ;$ 5555,0000,AAAA,FFFF
;3864   ;$ 5555,5555,AAAA,AAAA
;3865   ;$ AA55,FFFF
;3866   ;$ AAAA,AAAA
;3867   ;$ 4150,0000,42A0,0000
;3868
;3869
```

```
                                         ;3870   .PAGE   "TEST 124       BDEST AND 16 BIT BDEST DECODE"
                                         ;3871   ;*************************************************************************
                                         ;3872   ;++
                                         ;3873   ; TEST  124     BDEST AND 16 BIT BDEST DECODE
                                         ;3874   ;
                                         ;3875   ; TEST DESCRIPTION
                                         ;3876   ;       THIS TEST CHECKS THE OPCODES THAT ASSERT BDEST AND/OR 16 BIT
                                         ;3877   ;       BDEST. THIS IS DONE BY LOADING THE IB WITH THE OPCODE AND READING
                                         ;3878   ;       THE D MUX TO CHECK IF THE SIGNALS ASSERTED OR NOT.
                                         ;3879   ;
                                         ;3880   ;       SUBTST 1 - CHECK OPCODES FOR BDEST OR 16 BIT BDEST ON THE
                                         ;3881   ;                  A FORK.
                                         ;3882   ;       SUBTST 2 - CHECK THAT AN IBC CODE OF 7 ASSERTS BDEST.
                                         ;3883   ;
                                         ;3884   ; LOGIC DESCRIPTION
                                         ;3885   ;       THIS TEST CHECKS THE LOGIC THAT GENERATES THE BDEST AND 16 BIT
                                         ;3886   ;       BDEST SIGNALS ON THE IDP MODULE.
                                         ;3887   ;
                                         ;3888   ; ERROR DESCRIPTION
                                         ;3889   ;       DATA: EXPECTED D MUX DATA
                                         ;3890   ;             RECEIVED D MUX DATA
                                         ;3891   ;             LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY IN THE
                                         ;3892   ;               IB.
                                         ;3893   ;
                                         ;3894   ; SYNC POINT DESCRIPTION
                                         ;3895   ;       SUBTST 1 - SYNC10--D MUX IS READ ONTO THE ID BUS
                                         ;3896   ;       SUBTST 2 - SYNC11--D MUX IS READ ONTO THE ID BUS
                                         ;3897   ;--
                                         ;3898   ;*************************************************************************
                                         ;3899   =0
U 116A, 0018,0039,0D80,09F8,0000,1191    ;3900   T124:   NEWTST[.3]
U 116B, 0000,003C,0180,0800,0000,116C    ;3901           NOP
U 116C, 0818,0039,D580,0800,0000,11B3    ;3902   =0      D_K[.6],CALL,J/DC9              ; GEN ADDRESS OF EXPECTED DATA
U 116D, 0000,003C,0180,0800,0000,116E    ;3903           NOP
U 116E, 0000,003D,0180,0800,0000,11B2    ;3904   =0      CALL,J/DC8
U 116F, 0001,003C,0180,0A80,0000,1170    ;3905           R[0]_D                          ; SAVE
U 1170, 0818,0039,D580,0800,0000,11B7    ;3906   =0      D_K[.6],CALL,J/DCD              ; GEN ADDRESS OF IBUFF DATA
U 1171, 0000,003C,0180,0800,0000,1172    ;3907           NOP
U 1172, 0000,003D,0180,0800,0000,11B2    ;3908   =0      CALL,J/DC8
U 1173, 0001,003C,0180,0A88,0000,13D9    ;3909           R[1]_D                          ; SAVE
                                         ;3910
                                         ;3911   ;/////////////////////////////////////////////////////////////////////////
                                         ;3912   ;+
                                         ;3913   ; IBC NOT EQUAL TO 7
                                         ;3914   ;-
                                         ;3915
U 13D9, 0018,0038,F580,09E0,0000,1174    ;3916   T124S1: RC[0C]_K[.A]                    ; SET THE LOOP COUNT
U 1174, 0000,003D,0180,0800,0000,11BF    ;3917   =0      SUBTEST
U 1175, 0000,003C,0180,0A00,0200,13DA    ;3918   T124L1: VA_R[0]                         ; LOAD ADDRESS OF EXP DATA
U 13DA, 0000,003C,0180,C800,0000,13DB    ;3919           D[LONG]_CACHE.P                 ; FETCH THE EXPECTED DATA
U 13DB, 0001,003C,0180,09F0,0000,1176    ;3920           RC[0E]_D                        ; SAVE
U 1176, 0000,003D,0180,0800,0000,11A5    ;3921   =0      ERLOOP
U 1177, 0810,0038,0180,0970,0000,1178    ;3922           D_RC[0E]                        ; GET EXP DATA
U 1178, 2000,003D,0180,0A08,4200,11C5    ;3923   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IBUFFER
U 1179, 0000,003C,01F0,2C00,0000,13DC    ;3924   SYNC10: Q_ID[IBUF]                      ; READ THE DMUX
```

```
U 13DC, 001D,2000,0180,0800,0010,13DD   ;3925           ALU_Q-D,CLK.UBCC                   ; DATA OK?
U 13DD, 0000,013C,0180,0A08,0000,117A   ;3926           Z?,LAB_R[1]                        ; BRANCH IF YES
U 117A, 0001,203D,0180,09E8,0000,11A8   ;3927   =0      ERROR2,RC[0D]_Q
U 117B, 0000,003C,0180,0A08,0000,13DE   ;3928           LAB_R[1]
U 13DE, 0018,0014,1180,0A88,0000,13DF   ;3929           R[1]_LA+K[.4]                      ; INCREMENT ADR OF IB DATA
U 13DF, 0000,003C,0180,0A00,0000,13E0   ;3930           LAB_R[0]
U 13E0, 0018,0014,1180,0A80,0000,13E1   ;3931           R[0]_LA+K[.4]                      ; INCREMENT ADR OF EXP DATA
U 13E1, 0810,0038,0180,0960,0000,13E2   ;3932           D_RC[0C]                           ; GET THE LOOP COUNT
U 13E2, 0019,8000,0580,09E0,0010,13E3   ;3933           RC[0C]_D-K[.1],CLK.UBCC,BYTE       ; DECREMENT AND CHECK
U 13E3, 0000,013C,0180,0A00,0000,117C   ;3934           Z?,LAB_R[0]                        ; BRANCH IF FINISHED
U 117C, 0000,003C,0180,0800,0000,1175   ;3935   =0      J/T124L1                           ; CONTINUE
                                        ;3936
                                        ;3937
                                        ;3938   ;//////////////////////////////////////////////////////////////////////
                                        ;3939   ;+
                                        ;3940   ; IBC EQUALS 7
                                        ;3941   ;-
                                        ;3942
U 117D, 0018,0038,D580,09E0,0000,117E   ;3943   T124S2: RC[0C]_K[.6]                       ; SET THE LOOP COUNT
U 117E, 0000,003D,0180,0800,0000,11BF   ;3944   =0      SUBTEST
U 117F, 0000,003C,0180,0A00,0200,13E4   ;3945   T124L2: VA_R[0]                            ; LOAD ADDRESS OF EXP DATA
U 13E4, 0000,003C,0180,C800,0000,13E5   ;3946           D[LONG]_CACHE.P                    ; FETCH THE EXPECTED DATA
U 13E5, 0001,003C,0180,09F0,0000,1180   ;3947           RC[0E]_D                           ; SAVE
U 1180, 0000,003D,0180,0800,0000,11A5   ;3948   =0      ERLOOP
U 1181, 0810,0038,0180,0970,0000,1182   ;3949           D_RC[0E]                           ; GET EXP DATA
U 1182, 2000,003D,0180,0A08,4200,11C5   ;3950   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT    ; LOAD THE IBUFFER
U 1183, 7000,003C,01F0,2C00,0000,13E6   ;3951   SYNC11: Q_ID[IBUF],IBC/BDEST               ; READ THE DMUX
U 13E6, 001D,2000,0180,0800,0010,13E7   ;3952           ALU_Q-D,CLK.UBCC                   ; DATA OK?
U 13E7, 0000,013C,0180,0A08,0000,1184   ;3953           Z?,LAB_R[1]                        ; BRANCH IF YES
U 1184, 0001,203D,0180,09E8,0000,11A8   ;3954   =0      ERROR2,RC[0D]_Q
U 1185, 0000,003C,0180,0A08,0000,13E8   ;3955           LAB_R[1]
U 13E8, 0018,0014,1180,0A88,0000,13E9   ;3956           R[1]_LA+K[.4]                      ; INCREMENT ADR OF IB DATA
U 13E9, 0000,003C,0180,0A00,0000,13EA   ;3957           LAB_R[0]
U 13EA, 0018,0014,1180,0A80,0000,13EB   ;3958           R[0]_LA+K[.4]                      ; INCREMENT ADR OF IBUFFER DATA
U 13EB, 0810,0038,0180,0960,0000,13EC   ;3959           D_RC[0C]                           ; GET THE LOOP COUNT
U 13EC, 0019,8000,0580,09E0,0010,13ED   ;3960           RC[0C]_D-K[.1],CLK.UBCC,BYTE       ; DECREMENT AND CHECK
U 13ED, 0000,013C,0180,0A08,0000,1186   ;3961           Z?,LAB_R[1]                        ; BRANCH IF FINISHED
U 1186, 0000,003C,0180,0800,0000,117F   ;3962   =0      J/T124L2                           ; CONTINUE
U 1187, 0000,003C,0180,0800,0000,1188   ;3963           NOP
                                        ;3964   ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                        ;3965   ;% 698
                                        ;3966   ;$ FFFF,FFFF
                                        ;3967   ;$ 0040,0000
                                        ;3968   ;$ 0064,0000
                                        ;3969   ;$ 0068,0000
                                        ;3970   ;$ 0070,0000
                                        ;3971   ;$ 00E0,0000
                                        ;3972   ;$ FF60,FFFF
                                        ;3973   ;$ AAAA,FFFF
                                        ;3974   ;$ 0008,0000
                                        ;3975   ;$ 002C,0000
                                        ;3976   ;$ 0050,0000
                                        ;3977   ;$ 0050,0000
                                        ;3978   ;$ 0050,0000
                                        ;3979   ;$ 5050,0000
```

```
                                           ;3980    ;$ 5050,0000
                                           ;3981    ;$ 5050,0000
                                           ;3982    ;
                                           ;3983    ; THE FOLLOWING IS THE IBUFF DATA FOR THE ABOVE TEST:
                                           ;3984    ;% 6D8
                                           ;3985    ; SUBTEST 1, LOOP COUNT 0A THRU 01
                                           ;3986    ;$ FF10,0000
                                           ;3987    ;$ 5020,FFFF
                                           ;3988    ;$ 5032,FFFF
                                           ;3989    ;$ 5034,FFFF
                                           ;3990    ;$ 5038,FFFF
                                           ;3991    ;$ 5070,FFFF
                                           ;3992    ;$ 50B0,0000
                                           ;3993    ;$ AA30,00AA
                                           ;3994    ;$ 5004,5050
                                           ;3995    ;$ 5016,5050
                                           ;3996    ; SUBTEST 2, LOOP COUNT 06 THRU 01
                                           ;3997    ;$ 50D2,FFFF
                                           ;3998    ;$ 50D4,FFFF
                                           ;3999    ;$ 50E0,FFFF
                                           ;4000    ;$ 5040,FF50
                                           ;4001    ;$ 5080,FF50
                                           ;4002    ;$ 50D0,FF50
                                           ;4003
                                           ;4004
                                           ;4005    =0
U 1188, 0000,003D,0180,0800,0000,1191      ;4006    T125:   NEWTST
U 1189, 0000,003C,0180,0800,0000,118A      ;4007            NOP
                                           ;4008    =0
U 118A, 0000,003D,0180,0800,0000,1191      ;4009    T126:   NEWTST
U 118B, 0000,003C,0180,0800,0000,13EE      ;4010            NOP
U 13EE, 0000,003D,0180,0800,0000,1191      ;4011    ENDTST: NEWTST
```

```
;                             Location / Line Number Index

;Location       0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000          1876:    1845     1847=    1866=    1867=    1868=    1884=    1885=
U 1008          2343=    2344=    2345=    2346=    2354=    2355=    2358=    2359=
U 1010          2360=    2361=    2362=    2363=    2364=    2365=    2367=    2368=
U 1018          2370=    2371=    2377=    2378=    2380=    2381=    2382=    2383=
U 1020          2384=    2385=    2386=    2387=    2389=    2390=    2392=    2393=
U 1028          2443=    2444=    2447=    2448=    2455=    2456=    2464=    2465=
U 1030          2466=    2467=    2468=    2469=    2471=    2477=    2484=    2492=
U 1038          2493=    2494=    2501=    2502=    2503=    2504=    2505=    2506=
U 1040          2508=    2509=    2516=    2524=    2525=    2526=    2532=    2533=
U 1048          2534=    2535=    2537=    2538=    2540=    2541=    1920:    1846
U 1050          2552=    2553=    2566=    2567=    2568=    2569=    2571=    2572=
U 1058          2574=    2575=    1924:    1869     2582=    2590=    1928:    1870
U 1060          2591=    2592=    2600=    2601=    2602=    2603=    2605=    2606=
U 1068          2608=    2609=    2698=    2699=    2703=    2704=    2715=    2716=
U 1070          2717=    2718=    2719=    2720=    2722=    2728=    2735=    2736=
U 1078          2839=    2840=    2841=    2842=    2843=    2844=    2845=    2846=
U 1080          2847=    2848=    2860=    2861=    2862=    2863=    2866=    2867=
U 1088          2874=    2875=    2877=    2878=    2890=    2898=    2899=    2900=
U 1090          2902=    2903=    2906=    2907=    2914=    2915=    2917=    2923=
U 1098          2930=    2938=    2939=    2940=    2942=    2943=    2946=    2947=
U 10A0          2954=    2955=    2957=    2963=    2970=    2978=    2979=    2980=
U 10A8          2981=    2982=    2985=    2986=    2993=    2994=    2996=    2997=
U 10B0          3060=    3061=    3062=    3063=    3064=    3065=    3066=    3067=
U 10B8          3075=    3076=    3082=    3083=    3084=    3085=    3086=    3087=
U 10C0          3089=    3090=    3097=    3104=    3106=    3107=    3110=    3111=
U 10C8          3112=    3113=    3114=    3115=    3117=    3118=    3125=    3126=
U 10D0          3273=    3274=    3275=    3276=    3277=    3278=    3279=    3280=
U 10D8          3281=    3282=    3283=    3284=    3295=    3296=    3297=    3298=
U 10E0          3299=    3300=    3302=    3304=    3311=    3312=    3420=    3421=
U 10E8          3424=    3425=    3426=    3427=    3428=    3429=    3430=    3431=
U 10F0          3442=    3443=    3444=    3445=    3447=    3448=    3450=    3452=
U 10F8          3459=    3460=    3567=    3568=    3569=    3570=    3571=    3572=
U 1100          1831:    1832:    1833:    1834:    1835:    1836:    1837:    1838:
U 1108          1839:    1871     3573=    3574=    1840:    1841:    1842:    1843:
U 1110          3575=    3576=    3586=    3587=    3591=    3592=    3593=    3594=
U 1118          3597=    3598=    3604=    3614=    3615=    3616=    3619=    3620=
U 1120          3621=    3622=    3625=    3626=    3632=    3643=    3644=    3645=
U 1128          3648=    3649=    3650=    3651=    3654=    3655=    3661=    3672=
U 1130          3673=    3674=    3677=    3678=    3679=    3680=    3683=    3684=
U 1138          3690=    3701=    3702=    3703=    3706=    3707=    3708=    3709=
U 1140          3712=    3713=    3719=    3730=    3731=    3732=    3735=    3736=
U 1148          3737=    3738=    3741=    3742=    3748=    3758=    3759=    3760=
U 1150          3763=    3764=    3765=    3766=    1872     2012:    3769=    3770=
U 1158          3783=    3784=    3787=    3788=    3789=    3790=    3793=    3794=
U 1160          3808=    3809=    3812=    3813=    3814=    3815=    3818=    3819=
U 1168          3825=    3826=    3900=    3901=    3902=    3903=    3904=    3905=
U 1170          3906=    3907=    3908=    3909=    3917=    3918=    3921=    3922=
U 1178          3923=    3924=    3927=    3928=    3935=    3943=    3944=    3945=
U 1180          3948=    3949=    3950=    3951=    3954=    3955=    3962=    3963=
U 1188          4006=    4007=    4009=    4010=    1873     1874     1875     1882
U 1190          1883     1897     1898     1899     1900     1901     1902     1903
U 1198          1904     1905     1906     1907     1908     1909     1910     1911
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0           1912    1913    1914    1915    1916    1917    1918    1919
U 11A8           1922    1923    1966    1967    1968    1969    1970    1971
U 11B0           1972    1973    1974    1975    1976    1977    1978    1979
U 11B8           1980    1981    1983    1984    1985    1986    1988    1998
U 11C0           1999    2007    2008    2009    2023    2294    2295    2296
U 11C8           2297    2298    2300    2301    2305    2353    2356    2366
U 11D0           2369    2388    2391    2445    2446    2457    2458    2459
U 11D8           2460    2461    2462    2463    2470    2478    2479    2480
U 11E0           2481    2482    2483    2495    2496    2497    2498    2499
U 11E8           2500    2507    2510    2511    2512    2513    2514    2515
U 11F0           2527    2528    2529    2530    2531    2539    2542    2543
U 11F8           2544    2554    2555    2556    2557    2558    2559    2560
U 1200           2028:   2029:   2030:   2031:   2032:   2033:   2034:   2035:
U 1208           2036:   2037:   2038:   2039:   2040:   2041:   2042:   2043:
U 1210           2044:   2045:   2046:   2047:   2048:   2049:   2050:   2051:
U 1218           2052:   2053:   2054:   2055:   2056:   2057:   2058:   2059:
U 1220           2060:   2061:   2062:   2063:   2064:   2065:   2066:   2067:
U 1228           2068:   2069:   2070:   2071:   2072:   2073:   2074:   2075:
U 1230           2076:   2077:   2078:   2079:   2080:   2081:   2082:   2083:
U 1238           2084:   2085:   2086:   2087:   2088:   2089:   2090:   2091:
U 1240           2092:   2093:   2094:   2095:   2096:   2097:   2098:   2099:
U 1248           2100:   2101:   2102:   2103:   2104:   2105:   2106:   2107:
U 1250           2108:   2109:   2110:   2111:   2112:   2113:   2114:   2115:
U 1258           2116:   2117:   2118:   2119:   2120:   2121:   2122:   2123:
U 1260           2124:   2125:   2126:   2127:   2128:   2129:   2130:   2131:
U 1268           2132:   2133:   2134:   2135:   2136:   2137:   2138:   2139:
U 1270           2140:   2141:   2142:   2143:   2144:   2145:   2146:   2147:
U 1278           2148:   2149:   2150:   2151:   2152:   2153:   2154:   2155:
U 1280           2156:   2157:   2158:   2159:   2160:   2161:   2162:   2163:
U 1288           2164:   2165:   2166:   2167:   2168:   2169:   2170:   2171:
U 1290           2172:   2173:   2174:   2175:   2176:   2177:   2178:   2179:
U 1298           2180:   2181:   2182:   2183:   2184:   2185:   2186:   2187:
U 12A0           2188:   2189:   2190:   2191:   2192:   2193:   2194:   2195:
U 12A8           2196:   2197:   2198:   2199:   2200:   2201:   2202:   2203:
U 12B0           2204:   2205:   2206:   2207:   2208:   2209:   2210:   2211:
U 12B8           2212:   2213:   2214:   2215:   2216:   2217:   2218:   2219:
U 12C0           2220:   2221:   2222:   2223:   2224:   2225:   2226:   2227:
U 12C8           2228:   2229:   2230:   2231:   2232:   2233:   2234:   2235:
U 12D0           2236:   2237:   2238:   2239:   2240:   2241:   2242:   2243:
U 12D8           2244:   2245:   2246:   2247:   2248:   2249:   2250:   2251:
U 12E0           2252:   2253:   2254:   2255:   2256:   2257:   2258:   2259:
U 12E8           2260:   2261:   2262:   2263:   2264:   2265:   2266:   2267:
U 12F0           2268:   2269:   2270:   2271:   2272:   2273:   2274:   2275:
U 12F8           2276:   2277:   2278:   2279:   2280:   2281:   2282:   2283:
U 1300           2561    2562    2563    2564    2565    2570    2573    2576
U 1308           2577    2578    2579    2580    2581    2593    2594    2595
U 1310           2596    2597    2598    2599    2607    2700    2701    2702
U 1318           2712    2713    2714    2721    2729    2730    2731    2732
U 1320           2733    2734    2849    2850    2851    2852    2864    2865
U 1328           2868    2869    2870    2871    2872    2873    2876    2884
U 1330           2885    2886    2887    2888    2889    2901    2904    2905
U 1338           2908    2909    2910    2911    2912    2913    2916    2924
U 1340           2925    2926    2927    2928    2929    2941    2944    2945
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348           2948    2949    2950    2951    2952    2953    2956    2964
U 1350           2965    2966    2967    2968    2969    2983    2984    2987
U 1358           2988    2989    2990    2991    2992    2995    3077    3078
U 1360           3079    3080    3081    3088    3091    3092    3093    3094
U 1368           3095    3096    3105    3108    3109    3116    3119    3120
U 1370           3121    3122    3123    3124    3292    3293    3294    3301
U 1378           3305    3306    3307    3308    3309    3310    3422    3423
U 1380           3439    3440    3441    3446    3449    3453    3454    3455
U 1388           3456    3457    3458    3588    3589    3590    3595    3596
U 1390           3599    3600    3601    3602    3603    3617    3618    3623
U 1398           3624    3627    3628    3629    3630    3631    3646    3647
U 13A0           3652    3653    3656    3657    3658    3659    3660    3675
U 13A8           3676    3681    3682    3685    3686    3687    3688    3689
U 13B0           3704    3705    3710    3711    3714    3715    3716    3717
U 13B8           3718    3733    3734    3739    3740    3743    3744    3745
U 13C0           3746    3747    3761    3762    3767    3768    3771    3772
U 13C8           3782    3785    3786    3791    3792    3795    3796    3807
U 13D0           3810    3811    3816    3817    3820    3821    3822    3823
U 13D8           3824    3916    3919    3920    3925    3926    3929    3930
U 13E0           3931    3932    3933    3934    3946    3947    3952    3953
U 13E8           3956    3957    3958    3959    3960    3961    4011
U 13F0           1934:   1935:   1936:   1937:   1938:   1939:   1940:   1941:
U 13F8           1942:   1943:   1944:   1945:   1946:   1947:   1948:   1949:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH35       1023

Used            1023
Remaining

Total microwords used in memory U: 1023
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH35.MIC

Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3      Control ROM Field Definitions
; 548    Register Transfer Macro Definitions
; 1413   Non-transfer Functions
; 1485   Branch Enable Macro Definitions
; 1564   MICRO DIAGNOSTIC DEFINED MACROS
; 2392   TEST 127         EXECUTION POINT COUNTER AND FIRST PART DONE
; 2549   TEST 128         COMPATABILITY MODE A FORK DECODE
; 2664   TEST 129         COMPATABILITY MODE A FORK BRANCH INSTRUCTION DECODE
; 2763   TEST 12A         COMPATABILITY MODE B FORK DECODE
; 2882   TEST 12B         COMPATABILITY MODE C FORK DECODE
; 2946   TEST 12C         COMPATABILITY MODE STALL LOGIC
; 3033   TEST 12D         COMPATABILITY MODE D MUX SELECT
; 3270   TEST 12E         IBA BIT<1:0> CONTROL
; 3481   TEST 12F         M8224 IRD ROM BRANCH TEST
; 3610   TEST 130         M8224 IRD EXECUTION POINT COUNTER TEST
```

```
;1      .NOLIST
;1804   .LIST
;1805
```

```
                                          .REGION/1000,13FF

                                          ;+
                                          ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                          ; WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
                                          ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                          ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                          ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                          ;
                                          ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                          ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                          ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                          ;       R[OF] AND DO A RETURNO.
                                          ;
                                          ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                          ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                          ; TO THE CONSOLE.
                                          ;
                                          ; THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
                                          ; ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURNO IF THE TRAP WAS
                                          ; EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
                                          ; RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
                                          ; STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.
                                          ;-

U 1100, 0000,003C,19C0,0A78,0084,7001     1100:   SC_K[ZERO],Q_R[OF],J/TRPHO       ; SYSTEM INIT
U 1101, 0000,003C,05C0,0A78,0084,7001     1101:   SC_K[.1],Q_R[OF],J/TRPHO         ; DATA UNALIGNED
U 1102, 0000,003C,09C0,0A78,0084,7001     1102:   SC_K[.2],Q_R[OF],J/TRPHO         ; X PAGE ERROR
U 1103, 0000,003C,0DC0,0A78,0084,7001     1103:   SC_K[.3],Q_R[OF],J/TRPHO         ; TB MODIFY
U 1104, 0000,003C,11C0,0A78,0084,7001     1104:   SC_K[.4],Q_R[OF],J/TRPHO         ; TB PROT ERROR
U 1105, 0000,003C,D5C0,0A78,0084,7001     1105:   SC_K[.6],Q_R[OF],J/TRPHO         ; TB MISS
U 1106, 0000,003C,D9C0,0A78,0084,7001     1106:   SC_K[.9],Q_R[OF],J/TRPHO         ; RES FLOAT OPER
U 1107, 0000,003C,5DC0,0A78,0084,7001     1107:   SC_K[.7],Q_R[OF],J/TRPHO         ; TB PARITY
U 1108, 0000,003C,01C0,0A78,0084,7001     1108:   SC_K[.8],Q_R[OF],J/TRPHO         ; CACHE PARITY
U 110C, 0000,003C,85C0,0A78,0084,7001     110C:   SC_K[.C],Q_R[OF],J/TRPHO         ; RDS
U 110D, 0000,003C,89C0,0A78,0084,7001     110D:   SC_K[.D],Q_R[OF],J/TRPHO         ; TIME OUT
U 110E, 0000,003C,65C0,0A78,0084,7001     110E:   SC_K[.10],Q_R[OF],J/TRPHO        ; ODD ADDRESS
U 110F, 0000,003C,61C0,0A78,0084,7109     110F:   SC_K[.F],Q_R[OF],J/TRPH2         ; CS PARITY

U 1001, 0001,2024,0180,0800,0010,1006     TRPHO:  ALU_Q.ANDNOT.MASK,CLK.UBCC       ; WAS TRAP EXPECTED?
U 1006, 0000,013C,0180,0800,0000,1002             Z?                               ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000     =0      ALU_Q[AND]MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN



                                          ;+
                                          ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                          ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                          ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                          ;
                                          ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                          ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                          ;             FAULT STATUS REGISTER
                                          ;             SBI ERROR REGISTER
                                          ;             TIMEOUT ADDRESS REGISTER
                                          ;             MAINTENANCE REGISTER
```

```
                                       ;1861    ;               CACHE PARITY REGISTER
                                       ;1862    ;               TB ERROR REGISTER 1
                                       ;1863    ;               TB ERROR REGISTER 0
                                       ;1864    ;-
                                       ;1865
U 1003, 0018,0038,1D80,09E8,0000,1004  ;1866    TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,71BE  ;1867    =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,100B  ;1868            Q_ID[TBER0]
U 100B, 0001,203C,4DF0,2DB0,0000,100E  ;1869            RC[6]_Q,Q_ID[TBER1]
U 100E, 0001,203C,65F0,2DB8,0000,1013  ;1870            RC[7]_Q,Q_ID[SBI.ERR]
U 1013, 0001,203C,6DF0,2DD8,0000,1017  ;1871            RC[0B]_Q,Q_ID[FAULT]
U 1017, 0001,203C,75F0,2DE0,0000,104F  ;1872            RC[0C]_Q,Q_ID[MAINT]
U 104F, 0001,203C,79F0,2DC8,0000,105B  ;1873            RC[9]_Q,Q_ID[PARITY]
U 105B, 0001,203C,69F0,2DC0,0000,105F  ;1874            RC[8]_Q,Q_ID[TIME.ADDR]
U 105F, 0001,203C,81F0,2DD0,0000,1000  ;1875            RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,11A3  ;1876    1000:   RC[0E]_Q,ERROR1
                                       ;1877
                                       ;1878    ;+
                                       ;1879    ; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
                                       ;1880    ;-
                                       ;1881
U 1109, 0001,2024,0180,0800,0010,1154  ;1882    TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS THE TRAP EXPECTED?
U 1154, 0000,013C,0180,0800,0000,100C  ;1883            Z?                              ; BRANCH IF NO
U 100C, 0001,2036,0180,0AF8,0000,0001  ;1884    =0      ALU_Q[AND]MASK,R[0F]_ALU,RETURN1 ; RETURN
U 100D, 0000,003C,0180,0800,0000,1003  ;1885            J/TRPH1                         ; REPORT UNEXPECTED TRAP
                                       ;1886
                                       ;1887
                                       ;1888    ;+
                                       ;1889    ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                       ;1890    ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                       ;1891    ;                 NEWTST
                                       ;1892    ;                 ERLOOP
                                       ;1893    ;                 ERROR1
                                       ;1894    ;                 ERROR2
                                       ;1895    ;
                                       ;1896
U 118E, 0000,003C,65F8,0800,0084,718F  ;1897    SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 118F, 0818,0038,8D80,0800,0000,1190  ;1898            D_K[.1F]                        ; ...
U 1190, 0D00,003C,0180,0800,0000,1191  ;1899            D_DAL.SC
U 1191, 0000,003C,3D80,3C00,0000,1192  ;1900            ID[PSL]_D                       ; WRITE THE PSL
U 1192, 0818,0038,0580,0800,0000,1193  ;1901            D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 1193, 0D00,003C,0180,0800,0000,1194  ;1902            D_DAL.SC
U 1194, 0F00,003C,3180,3C00,0000,1195  ;1903            ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 1195, 0000,003C,5D80,3C00,0000,1196  ;1904            ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 1196, 0000,003C,3980,3C00,0000,1197  ;1905            ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 1197, 0000,003C,2980,3C00,0000,1198  ;1906            ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 1198, 0000,003C,4980,3C00,0000,1199  ;1907            ID[TBER0]_D                     ; SHUT OFF THE TB
U 1199, 0000,003C,7180,3C00,0000,119A  ;1908            ID[COMP]_D                      ; CLEAR SILO COMPARATOR
U 119A, 0818,0038,C180,0800,0000,119B  ;1909            D_K[.FFFF]
U 119B, 0000,003C,6580,3C00,0000,119C  ;1910            ID[SBI.ERR]_D
U 119C, 0F00,003C,6D80,3C00,0000,119D  ;1911            ID[FAULT]_D,D_0
U 119D, 0000,003C,6D80,3C00,0000,119E  ;1912            ID[FAULT]_D
U 119E, 0000,003C,6580,3C00,0000,119F  ;1913            ID[SBI.ERR]_D
U 119F, 0003,003C,0180,09F0,0000,11A0  ;1914            RC[0E]_0
U 11A0, 0003,003C,0180,0AF8,0000,11A1  ;1915            R[0F]_0
```

```
U 11A1, 0003,003C,0180,09E8,0000,105E   ;1916           RC[OD]_0,J/CALLCON              ; CALL THE CONSOLE
U 11A2, 0818,0038,0980,0800,0000,105E   ;1917   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 11A3, 0810,0038,0180,0978,0000,11A4   ;1918   ERROR1: D_RC[OF]
U 11A4, 0819,0034,4D80,0800,0000,104E   ;1919           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1920   104E:   D_D.OR.K[.4],J/CALLCON
                                        ;1921
U 11A5, 0810,0038,0180,0978,0000,11A6   ;1922   ERROR2: D_RC[OF]
U 11A6, 0819,0034,4D80,0800,0000,105A   ;1923           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1924   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1925
                                        ;1926   105E:
                                        ;1927   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1928           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1929
                                        ;1930   ;+
                                        ;1931   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1932   ;-
                                        ;1933
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1934   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1935   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1936   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1937   13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1938   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1939   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1940   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1941   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1942   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1943   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1944   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1945   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1946   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1947   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1948   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,11A7   ;1949   13FF:   NOP
                                        ;1950
                                        ;1951
                                        ;1952   ;+
                                        ;1953   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
                                        ;1954   ; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
                                        ;1955   ; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
                                        ;1956   ; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
                                        ;1957   ;
                                        ;1958   ; FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
                                        ;1959   ;       THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
                                        ;1960   ;
                                        ;1961   ;               =0      D_0,CALL,J/DC5
                                        ;1962   ;                       NOP
                                        ;1963   ;               =0      CALL,J/DC5
                                        ;1964   ;-
                                        ;1965
U 11A7, 0018,0038,1980,0800,0000,11B7   ;1966   DC0:    ALU_0(K),J/S00
U 11A8, 0018,0038,1980,0800,0000,11B8   ;1967   DC1:    ALU_0(K),J/S01
U 11A9, 0018,0038,1980,0800,0000,11B9   ;1968   DC2:    ALU_0(K),J/S10
U 11AA, 0018,0038,1980,0800,0000,11BA   ;1969   DC3:    ALU_0(K),J/S11
U 11AB, 0018,0038,0980,0800,0000,11B7   ;1970   DC4:    ALU_K[.2],J/S00
```

```
U 11AC, 0018,0038,0980,0800,0000,11B8        DC5:    ALU_K[.2],J/S01
U 11AD, 0018,0038,0980,0800,0000,11B9        DC6:    ALU_K[.2],J/S10
U 11AE, 0018,0038,0980,0800,0000,11BA        DC7:    ALU_K[.2],J/S11
U 11AF, 0018,0038,0580,0800,0000,11B7        DC8:    ALU_K[.1],J/S00
U 11B0, 0018,0038,0580,0800,0000,11B8        DC9:    ALU_K[.1],J/S01
U 11B1, 0018,0038,0580,0800,0000,11B9        DCA:    ALU_K[.1],J/S10
U 11B2, 0018,0038,0580,0800,0000,11BA        DCB:    ALU_K[.1],J/S11
U 11B3, 0018,0038,C180,0800,0000,11B7        DCC:    ALU_K[.FFFF],J/S00
U 11B4, 0018,0038,C180,0800,0000,11B8        DCD:    ALU_K[.FFFF],J/S01
U 11B5, 0018,0038,C180,0800,0000,11B9        DCE:    ALU_K[.FFFF],J/S10
U 11B6, 0018,0038,C180,0800,0000,11BA        DCF:    ALU_K[.FFFF],J/S11

U 11B7, 0118,0038,1B80,0800,0000,11BB        S00:    ALU_O(K),D_D.LEFT2,SI/7,J/SX
U 11B8, 0118,0038,0B80,0800,0000,11BB        S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 11B9, 0118,0038,0780,0800,0000,11BB        S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 11BA, 0118,0038,C380,0800,0000,11BB        S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX

U 11BB, 0100,003E,0380,0800,0000,0001        SX:     D_D.LEFT2,SI/7,RETURN1          ; EXIT


                                             ;+
                                             ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                             ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                             ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                             ; TYPING IT.
                                             ;-

U 11BC, 0810,0038,4D80,0978,0000,11BD        SUBTST: D_RC[OF],KMX/.FF00
U 11BD, 0019,4016,4D80,09F8,0000,0001                RC[OF]_D+K[.FF00],WORD,RETURN1

                                             ;+
                                             ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                             ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                             ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                             ;-

U 11BE, 0010,0038,01C0,0978,0000,11BF        SETRCF: Q_RC[OF]
U 11BF, 0019,2034,4DC0,0800,0000,11C0                Q_Q.AND.K[.FF00]
U 11C0, 0019,2032,1D80,09F8,0000,0001                RC[OF]_Q.OR.SC,RETURN1

```

```


                                            ;+
                                            ; THE FOLLOWING LOCATIONS ARE RESERVED FOR PATCHES
                                            ;-

U 13E0, 0000,003C,0180,0800,0000,13E1       13E0:   NOP
U 13E1, 0000,003C,0180,0800,0000,13E2       13E1:   NOP
U 13E2, 0000,003C,0180,0800,0000,13E3       13E2:   NOP
U 13E3, 0000,003C,0180,0800,0000,13E4       13E3:   NOP
U 13E4, 0000,003C,0180,0800,0000,13E5       13E4:   NOP
U 13E5, 0000,003C,0180,0800,0000,13E6       13E5:   NOP
U 13E6, 0000,003C,0180,0800,0000,13E7       13E6:   NOP
U 13E7, 0000,003C,0180,0800,0000,11C1       13E7:   NOP

                                            ;+
                                            ; THIS SUBROUTINE IS USED TO SET THE FIRST PART DONE BIT IN THE PSL
                                            ;-

U 11C1, 0818,0038,0180,0800,0000,11C2       SETFPD: D_K[.8]
U 11C2, 0B00,003C,3DF0,2C00,0000,11C3               D_D.SWAP,Q_ID[PSL]                  ; READ THE PSL
U 11C3, 081D,0030,0180,0800,0000,11C4               D_D.OR.Q                            ; OR IN FPD
U 11C4, 0000,003E,3D80,3C00,0000,0001               ID[PSL]_D,RETURN1                   ; LOAD THE PSL

                                            ;+
                                            ; THIS SUBROUTINE IS USED TO CLEAR THE FPD BIT IN THE PSL
                                            ;-

U 11C5, 0818,0038,0180,0800,0000,11C6       CLRFPD: D_K[.8]
U 11C6, 0B00,003C,3DF0,2C00,0000,11C7               D_D.SWAP,Q_ID[PSL]                  ; READ THE PSL
U 11C7, 081D,2024,0180,0800,0000,11C8               D_Q.ANDNOT.D                        ; CLEAR THE FPD BIT
U 11C8, 0000,003E,3D80,3C00,0000,0001               ID[PSL]_D,RETURN1                   ; LOAD THE PSL

                                            ;+
                                            ; THE FOLLOWING SUB ROUTINE IS USED TO CHECK IF THE "TWINKLE" ECO
                                            ; IS INSTALLED ON THIS MACHINE. THIS IS DONE BY CHECKING THE ECO
                                            ; LEVEL OF THE MACHINE AS RECORDED IN THE SYSTEM ID REGISTER. 'TWINKLED'
                                            ; MACHINES WILL HAVE AN ECO LEVEL OF '70' OR GREATER.
                                            ;
                                            ; THIS ROUTINE MUST BE CALLED WITH A CONSTRAINT OF "=00".
                                            ;
                                            ; THE ROUTINE EXITS WITH THE CONTENTS OF RC[OC] IN THE D REGISTER.
                                            ; A "RETURN1" IS MADE IF THE ECO IS PRESENT OTHERWISE, A RETURN2
                                            ; IS MADE.
                                            ;-
                                            CHECK_TWINKLE:
U 11C9, 0000,003C,0DF0,2C00,0000,11CA               Q_ID[SYS.ID]                        ; GET SYSTEM ECO LEVEL
U 11CA, 0C00,003C,6180,0800,0000,11CB               D_Q,K[.F]
U 11CB, 001B,0000,6180,0800,0082,11CC               SC_0-K[.F]                          ; SETUP TO SHIFT RIGHT
U 11CC, 0D00,003C,0180,0800,0000,1020               D_DAL.SC                            ; PUT IN BITS<8:0>
U 1020, 0818,0039,8DE0,0800,0000,11B6       =0      Q_D,D_K[.1F],CALL[DCF]              ; GENERATE FIELD MASK (= 1FF(X))
U 1021, 081D,0034,0180,0800,0000,11CD               D_D.AND.Q                           ; MASK
U 11CD, 0018,0038,F9C0,0800,0000,11CE               Q_K[.7E]                            ; GENERATE ECO LEVEL OF A "TWINKLED"
U 11CE, 0019,2034,CDC0,0800,0000,11CF               Q_Q.AND.K[.F0]                      ; MACHINE (= 70(X))
U 11CF, 001D,0000,0180,0800,0010,11D0               ALU_D-Q,CLK.UBCC                    ; IS THIS MACHINE TWINKLED?
U 11D0, 0810,1B38,0180,0960,0000,1007               ALU_N?,D_RC[OC]
```

```
U 1007, 0000,003E,0180,0800,0000,0001   ;2066   =0111   RETURN1                         ; BRANCH IF YES
U 100F, 0000,003E,0180,0800,0000,0002   ;2067           RETURN2                         ; NO
                                        ;2068
                                        ;2069   ;+
                                        ;2070   ; THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
                                        ;2071   ; THE INSTRUCTION AT LOCATION "DISPAT" LOADS THE Q REGISTER WITH HEX 100
                                        ;2072   ; AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
                                        ;2073   ; THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
                                        ;2074   ; THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
                                        ;2075   ; THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.
                                        ;2076   ;-
                                        ;2077
                                        ;2078   SYNC00:
U 11D1, 0038,003B,41C0,0800,0000,1200   ;2079   DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/DISPATTBL
                                        ;2080
                                        ;2081
                                        ;2082   1200:
                                        ;2083   DISPATTBL:
U 1200, 0019,2000,05C0,0800,0000,1201   ;2084   1200:   Q_Q-K[.1]
U 1201, 0019,2000,05C0,0800,0000,1202   ;2085   1201:   Q_Q-K[.1]
U 1202, 0019,2000,05C0,0800,0000,1203   ;2086   1202:   Q_Q-K[.1]
U 1203, 0019,2000,05C0,0800,0000,1204   ;2087   1203:   Q_Q-K[.1]
U 1204, 0019,2000,05C0,0800,0000,1205   ;2088   1204:   Q_Q-K[.1]
U 1205, 0019,2000,05C0,0800,0000,1206   ;2089   1205:   Q_Q-K[.1]
U 1206, 0019,2000,05C0,0800,0000,1207   ;2090   1206:   Q_Q-K[.1]
U 1207, 0019,2000,05C0,0800,0000,1208   ;2091   1207:   Q_Q-K[.1]
U 1208, 0019,2000,05C0,0800,0000,1209   ;2092   1208:   Q_Q-K[.1]
U 1209, 0019,2000,05C0,0800,0000,120A   ;2093   1209:   Q_Q-K[.1]
U 120A, 0019,2000,05C0,0800,0000,120B   ;2094   120A:   Q_Q-K[.1]
U 120B, 0019,2000,05C0,0800,0000,120C   ;2095   120B:   Q_Q-K[.1]
U 120C, 0019,2000,05C0,0800,0000,120D   ;2096   120C:   Q_Q-K[.1]
U 120D, 0019,2000,05C0,0800,0000,120E   ;2097   120D:   Q_Q-K[.1]
U 120E, 0019,2000,05C0,0800,0000,120F   ;2098   120E:   Q_Q-K[.1]
U 120F, 0019,2000,05C0,0800,0000,1210   ;2099   120F:   Q_Q-K[.1]
U 1210, 0019,2000,05C0,0800,0000,1211   ;2100   1210:   Q_Q-K[.1]
U 1211, 0019,2000,05C0,0800,0000,1212   ;2101   1211:   Q_Q-K[.1]
U 1212, 0019,2000,05C0,0800,0000,1213   ;2102   1212:   Q_Q-K[.1]
U 1213, 0019,2000,05C0,0800,0000,1214   ;2103   1213:   Q_Q-K[.1]
U 1214, 0019,2000,05C0,0800,0000,1215   ;2104   1214:   Q_Q-K[.1]
U 1215, 0019,2000,05C0,0800,0000,1216   ;2105   1215:   Q_Q-K[.1]
U 1216, 0019,2000,05C0,0800,0000,1217   ;2106   1216:   Q_Q-K[.1]
U 1217, 0019,2000,05C0,0800,0000,1218   ;2107   1217:   Q_Q-K[.1]
U 1218, 0019,2000,05C0,0800,0000,1219   ;2108   1218:   Q_Q-K[.1]
U 1219, 0019,2000,05C0,0800,0000,121A   ;2109   1219:   Q_Q-K[.1]
U 121A, 0019,2000,05C0,0800,0000,121B   ;2110   121A:   Q_Q-K[.1]
U 121B, 0019,2000,05C0,0800,0000,121C   ;2111   121B:   Q_Q-K[.1]
U 121C, 0019,2000,05C0,0800,0000,121D   ;2112   121C:   Q_Q-K[.1]
U 121D, 0019,2000,05C0,0800,0000,121E   ;2113   121D:   Q_Q-K[.1]
U 121E, 0019,2000,05C0,0800,0000,121F   ;2114   121E:   Q_Q-K[.1]
U 121F, 0019,2000,05C0,0800,0000,1220   ;2115   121F:   Q_Q-K[.1]
U 1220, 0019,2000,05C0,0800,0000,1221   ;2116   1220:   Q_Q-K[.1]
U 1221, 0019,2000,05C0,0800,0000,1222   ;2117   1221:   Q_Q-K[.1]
U 1222, 0019,2000,05C0,0800,0000,1223   ;2118   1222:   Q_Q-K[.1]
U 1223, 0019,2000,05C0,0800,0000,1224   ;2119   1223:   Q_Q-K[.1]
U 1224, 0019,2000,05C0,0800,0000,1225   ;2120   1224:   Q_Q-K[.1]
```

```
U 1225, 0019,2000,05C0,0800,0000,1226   ;2121     1225:    Q_Q-K[.1]
U 1226, 0019,2000,05C0,0800,0000,1227   ;2122     1226:    Q_Q-K[.1]
U 1227, 0019,2000,05C0,0800,0000,1228   ;2123     1227:    Q_Q-K[.1]
U 1228, 0019,2000,05C0,0800,0000,1229   ;2124     1228:    Q_Q-K[.1]
U 1229, 0019,2000,05C0,0800,0000,122A   ;2125     1229:    Q_Q-K[.1]
U 122A, 0019,2000,05C0,0800,0000,122B   ;2126     122A:    Q_Q-K[.1]
U 122B, 0019,2000,05C0,0800,0000,122C   ;2127     122B:    Q_Q-K[.1]
U 122C, 0019,2000,05C0,0800,0000,122D   ;2128     122C:    Q_Q-K[.1]
U 122D, 0019,2000,05C0,0800,0000,122E   ;2129     122D:    Q_Q-K[.1]
U 122E, 0019,2000,05C0,0800,0000,122F   ;2130     122E:    Q_Q-K[.1]
U 122F, 0019,2000,05C0,0800,0000,1230   ;2131     122F:    Q_Q-K[.1]
U 1230, 0019,2000,05C0,0800,0000,1231   ;2132     1230:    Q_Q-K[.1]
U 1231, 0019,2000,05C0,0800,0000,1232   ;2133     1231:    Q_Q-K[.1]
U 1232, 0019,2000,05C0,0800,0000,1233   ;2134     1232:    Q_Q-K[.1]
U 1233, 0019,2000,05C0,0800,0000,1234   ;2135     1233:    Q_Q-K[.1]
U 1234, 0019,2000,05C0,0800,0000,1235   ;2136     1234:    Q_Q-K[.1]
U 1235, 0019,2000,05C0,0800,0000,1236   ;2137     1235:    Q_Q-K[.1]
U 1236, 0019,2000,05C0,0800,0000,1237   ;2138     1236:    Q_Q-K[.1]
U 1237, 0019,2000,05C0,0800,0000,1238   ;2139     1237:    Q_Q-K[.1]
U 1238, 0019,2000,05C0,0800,0000,1239   ;2140     1238:    Q_Q-K[.1]
U 1239, 0019,2000,05C0,0800,0000,123A   ;2141     1239:    Q_Q-K[.1]
U 123A, 0019,2000,05C0,0800,0000,123B   ;2142     123A:    Q_Q-K[.1]
U 123B, 0019,2000,05C0,0800,0000,123C   ;2143     123B:    Q_Q-K[.1]
U 123C, 0019,2000,05C0,0800,0000,123D   ;2144     123C:    Q_Q-K[.1]
U 123D, 0019,2000,05C0,0800,0000,123E   ;2145     123D:    Q_Q-K[.1]
U 123E, 0019,2000,05C0,0800,0000,123F   ;2146     123E:    Q_Q-K[.1]
U 123F, 0019,2000,05C0,0800,0000,1240   ;2147     123F:    Q_Q-K[.1]
U 1240, 0019,2000,05C0,0800,0000,1241   ;2148     1240:    Q_Q-K[.1]
U 1241, 0019,2000,05C0,0800,0000,1242   ;2149     1241:    Q_Q-K[.1]
U 1242, 0019,2000,05C0,0800,0000,1243   ;2150     1242:    Q_Q-K[.1]
U 1243, 0019,2000,05C0,0800,0000,1244   ;2151     1243:    Q_Q-K[.1]
U 1244, 0019,2000,05C0,0800,0000,1245   ;2152     1244:    Q_Q-K[.1]
U 1245, 0019,2000,05C0,0800,0000,1246   ;2153     1245:    Q_Q-K[.1]
U 1246, 0019,2000,05C0,0800,0000,1247   ;2154     1246:    Q_Q-K[.1]
U 1247, 0019,2000,05C0,0800,0000,1248   ;2155     1247:    Q_Q-K[.1]
U 1248, 0019,2000,05C0,0800,0000,1249   ;2156     1248:    Q_Q-K[.1]
U 1249, 0019,2000,05C0,0800,0000,124A   ;2157     1249:    Q_Q-K[.1]
U 124A, 0019,2000,05C0,0800,0000,124B   ;2158     124A:    Q_Q-K[.1]
U 124B, 0019,2000,05C0,0800,0000,124C   ;2159     124B:    Q_Q-K[.1]
U 124C, 0019,2000,05C0,0800,0000,124D   ;2160     124C:    Q_Q-K[.1]
U 124D, 0019,2000,05C0,0800,0000,124E   ;2161     124D:    Q_Q-K[.1]
U 124E, 0019,2000,05C0,0800,0000,124F   ;2162     124E:    Q_Q-K[.1]
U 124F, 0019,2000,05C0,0800,0000,1250   ;2163     124F:    Q_Q-K[.1]
U 1250, 0019,2000,05C0,0800,0000,1251   ;2164     1250:    Q_Q-K[.1]
U 1251, 0019,2000,05C0,0800,0000,1252   ;2165     1251:    Q_Q-K[.1]
U 1252, 0019,2000,05C0,0800,0000,1253   ;2166     1252:    Q_Q-K[.1]
U 1253, 0019,2000,05C0,0800,0000,1254   ;2167     1253:    Q_Q-K[.1]
U 1254, 0019,2000,05C0,0800,0000,1255   ;2168     1254:    Q_Q-K[.1]
U 1255, 0019,2000,05C0,0800,0000,1256   ;2169     1255:    Q_Q-K[.1]
U 1256, 0019,2000,05C0,0800,0000,1257   ;2170     1256:    Q_Q-K[.1]
U 1257, 0019,2000,05C0,0800,0000,1258   ;2171     1257:    Q_Q-K[.1]
U 1258, 0019,2000,05C0,0800,0000,1259   ;2172     1258:    Q_Q-K[.1]
U 1259, 0019,2000,05C0,0800,0000,125A   ;2173     1259:    Q_Q-K[.1]
U 125A, 0019,2000,05C0,0800,0000,125B   ;2174     125A:    Q_Q-K[.1]
U 125B, 0019,2000,05C0,0800,0000,125C   ;2175     125B:    Q_Q-K[.1]
```

```
U 125C, 0019,2000,05C0,0800,0000,125D   ;2176    125C:     Q_Q-K[.1]
U 125D, 0019,2000,05C0,0800,0000,125E   ;2177    125D:     Q_Q-K[.1]
U 125E, 0019,2000,05C0,0800,0000,125F   ;2178    125E:     Q_Q-K[.1]
U 125F, 0019,2000,05C0,0800,0000,1260   ;2179    125F:     Q_Q-K[.1]
U 1260, 0019,2000,05C0,0800,0000,1261   ;2180    1260:     Q_Q-K[.1]
U 1261, 0019,2000,05C0,0800,0000,1262   ;2181    1261:     Q_Q-K[.1]
U 1262, 0019,2000,05C0,0800,0000,1263   ;2182    1262:     Q_Q-K[.1]
U 1263, 0019,2000,05C0,0800,0000,1264   ;2183    1263:     Q_Q-K[.1]
U 1264, 0019,2000,05C0,0800,0000,1265   ;2184    1264:     Q_Q-K[.1]
U 1265, 0019,2000,05C0,0800,0000,1266   ;2185    1265:     Q_Q-K[.1]
U 1266, 0019,2000,05C0,0800,0000,1267   ;2186    1266:     Q_Q-K[.1]
U 1267, 0019,2000,05C0,0800,0000,1268   ;2187    1267:     Q_Q-K[.1]
U 1268, 0019,2000,05C0,0800,0000,1269   ;2188    1268:     Q_Q-K[.1]
U 1269, 0019,2000,05C0,0800,0000,126A   ;2189    1269:     Q_Q-K[.1]
U 126A, 0019,2000,05C0,0800,0000,126B   ;2190    126A:     Q_Q-K[.1]
U 126B, 0019,2000,05C0,0800,0000,126C   ;2191    126B:     Q_Q-K[.1]
U 126C, 0019,2000,05C0,0800,0000,126D   ;2192    126C:     Q_Q-K[.1]
U 126D, 0019,2000,05C0,0800,0000,126E   ;2193    126D:     Q_Q-K[.1]
U 126E, 0019,2000,05C0,0800,0000,126F   ;2194    126E:     Q_Q-K[.1]
U 126F, 0019,2000,05C0,0800,0000,1270   ;2195    126F:     Q_Q-K[.1]
U 1270, 0019,2000,05C0,0800,0000,1271   ;2196    1270:     Q_Q-K[.1]
U 1271, 0019,2000,05C0,0800,0000,1272   ;2197    1271:     Q_Q-K[.1]
U 1272, 0019,2000,05C0,0800,0000,1273   ;2198    1272:     Q_Q-K[.1]
U 1273, 0019,2000,05C0,0800,0000,1274   ;2199    1273:     Q_Q-K[.1]
U 1274, 0019,2000,05C0,0800,0000,1275   ;2200    1274:     Q_Q-K[.1]
U 1275, 0019,2000,05C0,0800,0000,1276   ;2201    1275:     Q_Q-K[.1]
U 1276, 0019,2000,05C0,0800,0000,1277   ;2202    1276:     Q_Q-K[.1]
U 1277, 0019,2000,05C0,0800,0000,1278   ;2203    1277:     Q_Q-K[.1]
U 1278, 0019,2000,05C0,0800,0000,1279   ;2204    1278:     Q_Q-K[.1]
U 1279, 0019,2000,05C0,0800,0000,127A   ;2205    1279:     Q_Q-K[.1]
U 127A, 0019,2000,05C0,0800,0000,127B   ;2206    127A:     Q_Q-K[.1]
U 127B, 0019,2000,05C0,0800,0000,127C   ;2207    127B:     Q_Q-K[.1]
U 127C, 0019,2000,05C0,0800,0000,127D   ;2208    127C:     Q_Q-K[.1]
U 127D, 0019,2000,05C0,0800,0000,127E   ;2209    127D:     Q_Q-K[.1]
U 127E, 0019,2000,05C0,0800,0000,127F   ;2210    127E:     Q_Q-K[.1]
U 127F, 0019,2000,05C0,0800,0000,1280   ;2211    127F:     Q_Q-K[.1]
U 1280, 0019,2000,05C0,0800,0000,1281   ;2212    1280:     Q_Q-K[.1]
U 1281, 0019,2000,05C0,0800,0000,1282   ;2213    1281:     Q_Q-K[.1]
U 1282, 0019,2000,05C0,0800,0000,1283   ;2214    1282:     Q_Q-K[.1]
U 1283, 0019,2000,05C0,0800,0000,1284   ;2215    1283:     Q_Q-K[.1]
U 1284, 0019,2000,05C0,0800,0000,1285   ;2216    1284:     Q_Q-K[.1]
U 1285, 0019,2000,05C0,0800,0000,1286   ;2217    1285:     Q_Q-K[.1]
U 1286, 0019,2000,05C0,0800,0000,1287   ;2218    1286:     Q_Q-K[.1]
U 1287, 0019,2000,05C0,0800,0000,1288   ;2219    1287:     Q_Q-K[.1]
U 1288, 0019,2000,05C0,0800,0000,1289   ;2220    1288:     Q_Q-K[.1]
U 1289, 0019,2000,05C0,0800,0000,128A   ;2221    1289:     Q_Q-K[.1]
U 128A, 0019,2000,05C0,0800,0000,128B   ;2222    128A:     Q_Q-K[.1]
U 128B, 0019,2000,05C0,0800,0000,128C   ;2223    128B:     Q_Q-K[.1]
U 128C, 0019,2000,05C0,0800,0000,128D   ;2224    128C:     Q_Q-K[.1]
U 128D, 0019,2000,05C0,0800,0000,128E   ;2225    128D:     Q_Q-K[.1]
U 128E, 0019,2000,05C0,0800,0000,128F   ;2226    128E:     Q_Q-K[.1]
U 128F, 0019,2000,05C0,0800,0000,1290   ;2227    128F:     Q_Q-K[.1]
U 1290, 0019,2000,05C0,0800,0000,1291   ;2228    1290:     Q_Q-K[.1]
U 1291, 0019,2000,05C0,0800,0000,1292   ;2229    1291:     Q_Q-K[.1]
U 1292, 0019,2000,05C0,0800,0000,1293   ;2230    1292:     Q_Q-K[.1]
```

```
U 1293, 0019,2000,05C0,0800,0000,1294   ;2231    1293:    Q_Q-K[.1]
U 1294, 0019,2000,05C0,0800,0000,1295   ;2232    1294:    Q_Q-K[.1]
U 1295, 0019,2000,05C0,0800,0000,1296   ;2233    1295:    Q_Q-K[.1]
U 1296, 0019,2000,05C0,0800,0000,1297   ;2234    1296:    Q_Q-K[.1]
U 1297, 0019,2000,05C0,0800,0000,1298   ;2235    1297:    Q_Q-K[.1]
U 1298, 0019,2000,05C0,0800,0000,1299   ;2236    1298:    Q_Q-K[.1]
U 1299, 0019,2000,05C0,0800,0000,129A   ;2237    1299:    Q_Q-K[.1]
U 129A, 0019,2000,05C0,0800,0000,129B   ;2238    129A:    Q_Q-K[.1]
U 129B, 0019,2000,05C0,0800,0000,129C   ;2239    129B:    Q_Q-K[.1]
U 129C, 0019,2000,05C0,0800,0000,129D   ;2240    129C:    Q_Q-K[.1]
U 129D, 0019,2000,05C0,0800,0000,129E   ;2241    129D:    Q_Q-K[.1]
U 129E, 0019,2000,05C0,0800,0000,129F   ;2242    129E:    Q_Q-K[.1]
U 129F, 0019,2000,05C0,0800,0000,12A0   ;2243    129F:    Q_Q-K[.1]
U 12A0, 0019,2000,05C0,0800,0000,12A1   ;2244    12A0:    Q_Q-K[.1]
U 12A1, 0019,2000,05C0,0800,0000,12A2   ;2245    12A1:    Q_Q-K[.1]
U 12A2, 0019,2000,05C0,0800,0000,12A3   ;2246    12A2:    Q_Q-K[.1]
U 12A3, 0019,2000,05C0,0800,0000,12A4   ;2247    12A3:    Q_Q-K[.1]
U 12A4, 0019,2000,05C0,0800,0000,12A5   ;2248    12A4:    Q_Q-K[.1]
U 12A5, 0019,2000,05C0,0800,0000,12A6   ;2249    12A5:    Q_Q-K[.1]
U 12A6, 0019,2000,05C0,0800,0000,12A7   ;2250    12A6:    Q_Q-K[.1]
U 12A7, 0019,2000,05C0,0800,0000,12A8   ;2251    12A7:    Q_Q-K[.1]
U 12A8, 0019,2000,05C0,0800,0000,12A9   ;2252    12A8:    Q_Q-K[.1]
U 12A9, 0019,2000,05C0,0800,0000,12AA   ;2253    12A9:    Q_Q-K[.1]
U 12AA, 0019,2000,05C0,0800,0000,1155   ;2254    12AA:    Q_Q-K[.1]                     ; THIS WORD IS ECO'D TO 1155
U 1155, 0019,2000,05C0,0800,0000,12AB   ;2255    1155:    Q_Q-K[.1],J/12AB
U 12AB, 0019,2000,05C0,0800,0000,12AC   ;2256    12AB:    Q_Q-K[.1]
U 12AC, 0019,2000,05C0,0800,0000,12AD   ;2257    12AC:    Q_Q-K[.1]
U 12AD, 0019,2000,05C0,0800,0000,12AE   ;2258    12AD:    Q_Q-K[.1]
U 12AE, 0019,2000,05C0,0800,0000,12AF   ;2259    12AE:    Q_Q-K[.1]
U 12AF, 0019,2000,05C0,0800,0000,12B0   ;2260    12AF:    Q_Q-K[.1]
U 12B0, 0019,2000,05C0,0800,0000,12B1   ;2261    12B0:    Q_Q-K[.1]
U 12B1, 0019,2000,05C0,0800,0000,12B2   ;2262    12B1:    Q_Q-K[.1]
U 12B2, 0019,2000,05C0,0800,0000,12B3   ;2263    12B2:    Q_Q-K[.1]
U 12B3, 0019,2000,05C0,0800,0000,12B4   ;2264    12B3:    Q_Q-K[.1]
U 12B4, 0019,2000,05C0,0800,0000,12B5   ;2265    12B4:    Q_Q-K[.1]
U 12B5, 0019,2000,05C0,0800,0000,12B6   ;2266    12B5:    Q_Q-K[.1]
U 12B6, 0019,2000,05C0,0800,0000,12B7   ;2267    12B6:    Q_Q-K[.1]
U 12B7, 0019,2000,05C0,0800,0000,12B8   ;2268    12B7:    Q_Q-K[.1]
U 12B8, 0019,2000,05C0,0800,0000,12B9   ;2269    12B8:    Q_Q-K[.1]
U 12B9, 0019,2000,05C0,0800,0000,12BA   ;2270    12B9:    Q_Q-K[.1]
U 12BA, 0019,2000,05C0,0800,0000,12BB   ;2271    12BA:    Q_Q-K[.1]
U 12BB, 0019,2000,05C0,0800,0000,12BC   ;2272    12BB:    Q_Q-K[.1]
U 12BC, 0019,2000,05C0,0800,0000,12BD   ;2273    12BC:    Q_Q-K[.1]
U 12BD, 0019,2000,05C0,0800,0000,12BE   ;2274    12BD:    Q_Q-K[.1]
U 12BE, 0019,2000,05C0,0800,0000,12BF   ;2275    12BE:    Q_Q-K[.1]
U 12BF, 0019,2000,05C0,0800,0000,12C0   ;2276    12BF:    Q_Q-K[.1]
U 12C0, 0019,2000,05C0,0800,0000,12C1   ;2277    12C0:    Q_Q-K[.1]
U 12C1, 0019,2000,05C0,0800,0000,12C2   ;2278    12C1:    Q_Q-K[.1]
U 12C2, 0019,2000,05C0,0800,0000,12C3   ;2279    12C2:    Q_Q-K[.1]
U 12C3, 0019,2000,05C0,0800,0000,12C4   ;2280    12C3:    Q_Q-K[.1]
U 12C4, 0019,2000,05C0,0800,0000,12C5   ;2281    12C4:    Q_Q-K[.1]
U 12C5, 0019,2000,05C0,0800,0000,12C6   ;2282    12C5:    Q_Q-K[.1]
U 12C6, 0019,2000,05C0,0800,0000,12C7   ;2283    12C6:    Q_Q-K[.1]
U 12C7, 0019,2000,05C0,0800,0000,12C8   ;2284    12C7:    Q_Q-K[.1]
U 12C8, 0019,2000,05C0,0800,0000,12C9   ;2285    12C8:    Q_Q-K[.1]
```

```
U 12C9, 0019,2000,05C0,0800,0000,12CA   ;2286   12C9:   Q_Q-K[.1]
U 12CA, 0019,2000,05C0,0800,0000,12CB   ;2287   12CA:   Q_Q-K[.1]
U 12CB, 0019,2000,05C0,0800,0000,12CC   ;2288   12CB:   Q_Q-K[.1]
U 12CC, 0019,2000,05C0,0800,0000,12CD   ;2289   12CC:   Q_Q-K[.1]
U 12CD, 0019,2000,05C0,0800,0000,12CE   ;2290   12CD:   Q_Q-K[.1]
U 12CE, 0019,2000,05C0,0800,0000,12CF   ;2291   12CE:   Q_Q-K[.1]
U 12CF, 0019,2000,05C0,0800,0000,12D0   ;2292   12CF:   Q_Q-K[.1]
U 12D0, 0019,2000,05C0,0800,0000,12D1   ;2293   12D0:   Q_Q-K[.1]
U 12D1, 0019,2000,05C0,0800,0000,12D2   ;2294   12D1:   Q_Q-K[.1]
U 12D2, 0019,2000,05C0,0800,0000,12D3   ;2295   12D2:   Q_Q-K[.1]
U 12D3, 0019,2000,05C0,0800,0000,12D4   ;2296   12D3:   Q_Q-K[.1]
U 12D4, 0019,2000,05C0,0800,0000,12D5   ;2297   12D4:   Q_Q-K[.1]
U 12D5, 0019,2000,05C0,0800,0000,12D6   ;2298   12D5:   Q_Q-K[.1]
U 12D6, 0019,2000,05C0,0800,0000,12D7   ;2299   12D6:   Q_Q-K[.1]
U 12D7, 0019,2000,05C0,0800,0000,12D8   ;2300   12D7:   Q_Q-K[.1]
U 12D8, 0019,2000,05C0,0800,0000,12D9   ;2301   12D8:   Q_Q-K[.1]
U 12D9, 0019,2000,05C0,0800,0000,12DA   ;2302   12D9:   Q_Q-K[.1]
U 12DA, 0019,2000,05C0,0800,0000,12DB   ;2303   12DA:   Q_Q-K[.1]
U 12DB, 0019,2000,05C0,0800,0000,12DC   ;2304   12DB:   Q_Q-K[.1]
U 12DC, 0019,2000,05C0,0800,0000,12DD   ;2305   12DC:   Q_Q-K[.1]
U 12DD, 0019,2000,05C0,0800,0000,12DE   ;2306   12DD:   Q_Q-K[.1]
U 12DE, 0019,2000,05C0,0800,0000,12DF   ;2307   12DE:   Q_Q-K[.1]
U 12DF, 0019,2000,05C0,0800,0000,12E0   ;2308   12DF:   Q_Q-K[.1]
U 12E0, 0019,2000,05C0,0800,0000,12E1   ;2309   12E0:   Q_Q-K[.1]
U 12E1, 0019,2000,05C0,0800,0000,12E2   ;2310   12E1:   Q_Q-K[.1]
U 12E2, 0019,2000,05C0,0800,0000,12E3   ;2311   12E2:   Q_Q-K[.1]
U 12E3, 0019,2000,05C0,0800,0000,12E4   ;2312   12E3:   Q_Q-K[.1]
U 12E4, 0019,2000,05C0,0800,0000,12E5   ;2313   12E4:   Q_Q-K[.1]
U 12E5, 0019,2000,05C0,0800,0000,12E6   ;2314   12E5:   Q_Q-K[.1]
U 12E6, 0019,2000,05C0,0800,0000,12E7   ;2315   12E6:   Q_Q-K[.1]
U 12E7, 0019,2000,05C0,0800,0000,12E8   ;2316   12E7:   Q_Q-K[.1]
U 12E8, 0019,2000,05C0,0800,0000,12E9   ;2317   12E8:   Q_Q-K[.1]
U 12E9, 0019,2000,05C0,0800,0000,12EA   ;2318   12E9:   Q_Q-K[.1]
U 12EA, 0019,2000,05C0,0800,0000,12EB   ;2319   12EA:   Q_Q-K[.1]
U 12EB, 0019,2000,05C0,0800,0000,12EC   ;2320   12EB:   Q_Q-K[.1]
U 12EC, 0019,2000,05C0,0800,0000,12ED   ;2321   12EC:   Q_Q-K[.1]
U 12ED, 0019,2000,05C0,0800,0000,12EE   ;2322   12ED:   Q_Q-K[.1]
U 12EE, 0019,2000,05C0,0800,0000,12EF   ;2323   12EE:   Q_Q-K[.1]
U 12EF, 0019,2000,05C0,0800,0000,12F0   ;2324   12EF:   Q_Q-K[.1]
U 12F0, 0019,2000,05C0,0800,0000,12F1   ;2325   12F0:   Q_Q-K[.1]
U 12F1, 0019,2000,05C0,0800,0000,12F2   ;2326   12F1:   Q_Q-K[.1]
U 12F2, 0019,2000,05C0,0800,0000,12F3   ;2327   12F2:   Q_Q-K[.1]
U 12F3, 0019,2000,05C0,0800,0000,12F4   ;2328   12F3:   Q_Q-K[.1]
U 12F4, 0019,2000,05C0,0800,0000,12F5   ;2329   12F4:   Q_Q-K[.1]
U 12F5, 0019,2000,05C0,0800,0000,12F6   ;2330   12F5:   Q_Q-K[.1]
U 12F6, 0019,2000,05C0,0800,0000,12F7   ;2331   12F6:   Q_Q-K[.1]
U 12F7, 0019,2000,05C0,0800,0000,12F8   ;2332   12F7:   Q_Q-K[.1]
U 12F8, 0019,2000,05C0,0800,0000,12F9   ;2333   12F8:   Q_Q-K[.1]
U 12F9, 0019,2000,05C0,0800,0000,12FA   ;2334   12F9:   Q_Q-K[.1]
U 12FA, 0019,2000,05C0,0800,0000,12FB   ;2335   12FA:   Q_Q-K[.1]
U 12FB, 0019,2000,05C0,0800,0000,12FC   ;2336   12FB:   Q_Q-K[.1]
U 12FC, 0019,2000,05C0,0800,0000,12FD   ;2337   12FC:   Q_Q-K[.1]
U 12FD, 0019,2000,05C0,0800,0000,12FE   ;2338   12FD:   Q_Q-K[.1]
U 12FE, 0019,2000,05C0,0800,0000,12FF   ;2339   12FE:   Q_Q-K[.1]
U 12FF, 0019,2002,05C0,0800,0000,0001   ;2340   12FF:   Q_Q-K[.1],RETURN1
```

```
                                         ;2341
                                         ;2342
                                         ;2343   ;+
                                         ;2344   ; THIS SUBROUTINE IS USED TO SET THE COMPATABILITY MODE BIT IN THE
                                         ;2345   ; PSL. THE OTHER BITS IN THE PSL ARE UNCHANGED.
                                         ;2346   ;-
                                         ;2347
U 11D2, 0000,003C,3DF0,2C00,0000,11D3    ;2348   SETCM:  Q_ID[PSL]
U 11D3, 0000,003C,8D80,0800,0084,71D4    ;2349           SC_K[.1F]
U 11D4, 0803,001C,0180,0800,0000,11D5    ;2350           D_NOT.MASK
U 11D5, 081D,0030,0180,0800,0000,11D6    ;2351           D_D.OR.Q
U 11D6, 0000,003E,3D80,3C00,0000,0001    ;2352           ID[PSL]_D,RETURN1
                                         ;2353
                                         ;2354
                                         ;2355   ;+
                                         ;2356   ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
                                         ;2357   ; CACHE REFERANCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
                                         ;2358   ; IS COMPLETELY FULL OF DATA.
                                         ;2359   ;
                                         ;2360   ; BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
                                         ;2361   ;-
                                         ;2362
U 11D7, 3000,003C,0180,6000,0000,11D8    ;2363   IBWAIT: LOAD.IB,IBC/START
U 11D8, 0000,003C,0180,F800,0000,11D9    ;2364           MCT/ALLOW.IB.READ
U 11D9, 0000,003C,0180,F800,0000,11DA    ;2365           MCT/ALLOW.IB.READ
U 11DA, 0000,003C,0180,F800,0000,11DB    ;2366           MCT/ALLOW.IB.READ
U 11DB, 0000,003C,0180,F800,0000,11DC    ;2367           MCT/ALLOW.IB.READ
U 11DC, 0000,003C,0180,F800,0000,11DD    ;2368   WAIT1:  MCT/ALLOW.IB.READ
U 11DD, 1000,003E,0180,F800,0000,0001    ;2369           MCT/ALLOW.IB.READ,IBC/STOP,RETURN1
                                         ;2370
                                         ;2371
                                         ;2372   IBWAITONCE:
U 11DE, 3000,003C,0180,6000,0000,11DC    ;2373           LOAD.IB,IBC/START,J/WAIT1
                                         ;2374
                                         ;2375
                                         ;2376   ;+
                                         ;2377   ; THE FOLLOWING SUBROUTINE IS USED BY THE IBA BITS <1:0> TEST. IT ALLOWS
                                         ;2378   ; THE IB TO READ ONE WORD FROM THE CACHE, AND THEN PUTS BYTE 7 IN BYTE 0.
                                         ;2379   ;-
                                         ;2380
                                         ;2381   GETBYTE7:
U 11DF, 3000,003C,0180,0800,0000,11E0    ;2382           IBC/START                       ; START THE IB
U 11E0, 0000,003C,0180,F800,0000,11E1    ;2383           MCT/ALLOW.IB.READ
U 11E1, 0000,003C,0180,F800,0000,11E2    ;2384           MCT/ALLOW.IB.READ
U 11E2, 0000,003C,0180,F800,0000,11E3    ;2385           MCT/ALLOW.IB.READ
U 11E3, 0000,003C,0180,F800,0000,11E4    ;2386           MCT/ALLOW.IB.READ
U 11E4, 1000,003C,0180,0800,0000,11E5    ;2387           IBC/STOP                        ; STOP THE IB
U 11E5, E000,003C,0180,0800,0000,11E6    ;2388           IBC/CLR.0-3                     ; SHIFT OUT 4 BYTES
U 11E6, 4000,003C,0180,0800,0000,11E7    ;2389           IBC/CLR.0.1                     ; AND TWO MORE
U 11E7, C000,003E,0180,0800,0000,0001    ;2390           IBC/CLR.0,RETURN1               ; AND ONE MORE
                                         ;2391
```

```
                                        .PAGE   "TEST 127       EXECUTION POINT COUNTER AND FIRST PART DONE"
                                        ;*************************************************************************
                                        ;++
                                        ;
                                        ; TEST  127     EXECUTION POINT COUNTER AND FIRST PART DONE
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST CHECKS THAT THE FIRST PART DONE (FPD) BIT IN THE PSL FORCES
                                        ;       THE EXECUTION POINT COUNTER TO ALL ONE'S. THIS IS DONE BY LOADING
                                        ;       THE IB WITH AN "ADDP4" OPCODE, SETTING FPD, EXECUTING THE SUB/SPEC
                                        ;       FUNCTION AND CHECKING THAT THE CORRECT ADDRESS WAS ASSERTED.
                                        ;
                                        ;       THIS TEST ALSO CHECKS THAT THE EXECUTION POINT COUNTER COUNTS WHEN
                                        ;       THE SUB/SPEC FUNCTION IS EXECUTED AND THE OPCODE DECODE CAUSES
                                        ;       A "SELECT EXECUTE".
                                        ;
                                        ;       SUBTST 1 - CHECK THAT FPD CAUSES THE EXEC POINT COUNTER TO ALL ONE'S.
                                        ;       SUBTST 2 - CHECK THAT THE EXECUTION POINT COUNTER COUNTS WHEN "SEL
                                        ;                  EXEC" IS TRUE.
                                        ;       SUBTST 3 - CHECK THAT THE EXEC POINT COUNTER DOES NOT COUNT WHEN
                                        ;                  "SRV+INV" IS TRUE. THIS IS DONE BY EXECUTING A SUB/SPEC
                                        ;                  FUNCTION IN COMPATABILITY MODE WITH B1 INVALID, THEN
                                        ;                  GOING BACK TO VAX MODE AND EXECUTING A SUB/SPEC FUNCTION
                                        ;                  AND CHECKING THAT THE OPCODE WAS DECODED CORRECTLY.
                                        ;       SUBTST 4 - CHECK THAT THE EXC PNT CTR COUNTS IN COMPATABILITY MODE
                                        ;                  BY EXECUTING A SUB/SPEC FUNCTION IN COMPATABILITY MODE,
                                        ;                  THEN SWITCHING BACK TO VAX MODE AND EXECUTING A SUB/SPEC
                                        ;                  FUNCTION AND CHECKING THAT THE DECODE FOR THE CTR BEING
                                        ;                  AT POINT 1 OCCURRED CORRECTLY.
                                        ;
                                        ;       NOTE: THE DATA FOR THIS TEST IS AFTER TEST 12E.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS THE LOGIC THAT CONTROLS THE EXECUTION POINT COUNTER
                                        ;       ON THE IRC MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                        ;             RECEIVED MICRO PC BITS <7:0>
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       SUBTST 1 - SYNC06--EXEC POINT COUNTER IS LOADED WITH ALL ONE'S.
                                        ;       SUBTST 2 - SYNC00--EXECUTION POINT COUNTER SHOULD INCREMENT AT
                                        ;                          THE END OF THIS INSTRUCTION.
                                        ;       SUBTST 3 - SYNC00--EXECUTION POINT COUNTER SHOULD NOT INCREMENT
                                        ;                          DURING THIS INSTRUCTION.
                                        ;       SUBTST 4 - SYNC00--EXECUTION POINT COUNTER SHOULD INCREMENT AT
                                        ;                          THE END OF THIS INSTRUCTION.
                                        ;--
                                        ;**********************************************************************
                                        =0
U 1022, 0000,003D,0180,0800,0000,118E   T127:   NEWTST
U 1023, 0018,0038,0980,09F8,0000,11E8           RC[OF]_K[.2]
U 11E8, 0818,0038,7980,0800,0000,1024           D_K[.30]
U 1024, 0819,0015,8580,0800,0000,11A7   =0      D_D+K[.C],CALL,J/DC0            ; GENERATE ADR OF IB DATA
```

```
U 1025, 0001,003C,0180,0A88,0000,1026   ;2447           R[1]_D                          ; EQUALS 3C0
U 1026, 0818,0039,1180,0800,0000,11AA   ;2448   =0      D_K[.4],CALL,J/DC3              ; GENERATE ADR OF ADDP4 EXECUTE
U 1027, 0001,003C,0180,09F0,0000,1028   ;2449           RC[0E]_D                        ; EQUALS 43
                                        ;2450
                                        ;2451   ;///////////////////////////////////////////////////////////////////////
                                        ;2452   ;+
                                        ;2453   ; FIRST CHECK THAT FPD FORCES THE EXEC POINT COUNTER TO ALL ONE'S.
                                        ;2454   ;-
                                        ;2455
                                        ;2456   =0
U 1028, 0000,003D,0180,0800,0000,11BC   ;2457   T127S1: SUBTEST
U 1029, 0000,003C,0180,0800,0000,102A   ;2458           NOP
U 102A, 0000,003D,0180,0800,0000,11A2   ;2459   =0      ERLOOP
U 102B, 0000,003C,0180,0800,0000,102C   ;2460           NOP
U 102C, 2000,003D,0180,0A08,4200,11D7   ;2461   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 102D, 0000,003C,0180,0800,0000,102E   ;2462           NOP
U 102E, 0000,003D,0180,0800,0000,11C1   ;2463   =0      CALL,J/SETFPD                   ; SET FIRST PART DONE
U 102F, 0000,003C,0180,0800,0000,1030   ;2464           NOP
U 1030, 0810,0039,0180,0970,0000,11D1   ;2465   =0      CALL,J/DISPAT,D_RC[0E]          ; EXECUTE THE SUB/SPEC
U 1031, 001D,A000,0180,0800,0010,11E9   ;2466           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 11E9, 0000,013C,0180,0800,0000,1032   ;2467           Z?
U 1032, 0001,203D,0180,09E8,0000,11A5   ;2468   =0      ERROR2,RC[0D]_Q                 ; FPD DID NOT FORCE EXC PNT CTR TO 7
                                        ;2469
                                        ;2470   ;///////////////////////////////////////////////////////////////////////
                                        ;2471   ;+
                                        ;2472   ; NOW CHECK THAT THE EXC PNT CTR COUNTS IN VAX MODE.
                                        ;2473   ;-
                                        ;2474
U 1033, 0018,0038,0180,09F0,0000,1034   ;2475   T127S2: RC[0E]_K[.8]                    ; SET THE EXPECTED ADDRESS
U 1034, 0000,003D,0180,0800,0000,11BC   ;2476   =0      SUBTEST
U 1035, 0000,003C,0180,0800,0000,1036   ;2477           NOP
U 1036, 0000,003D,0180,0800,0000,11A2   ;2478   =0      ERLOOP
U 1037, 0000,003C,0180,0800,0000,1038   ;2479           NOP
U 1038, 2000,003D,0180,0A08,4200,11D7   ;2480   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1039, 0000,003C,0180,0800,0000,103A   ;2481           NOP
U 103A, 0000,003D,0180,0800,0000,11C1   ;2482   =0      CALL,J/SETFPD                   ; SET FIRST PART DONE
U 103B, 0000,003C,0180,0800,0000,103C   ;2483           NOP
U 103C, 0000,003D,0180,0800,0000,11C5   ;2484   =0      CALL,J/CLRFPD                   ; CLEAR FIRST PART DONE
U 103D, 0000,003C,0180,0800,0000,103E   ;2485           NOP
U 103E, 0000,003D,0180,0800,0000,11D1   ;2486   =0      CALL,J/DISPAT                   ; SHOULD ADVANCE THE CTR TO 0
U 103F, 0810,0038,0180,0970,0000,1040   ;2487           D_RC[0E]
U 1040, 0000,003D,0180,0800,0000,11D1   ;2488   =0      CALL,J/DISPAT                   ; CHECK THAT EXC PNT CTR WENT TO ZERO
U 1041, 001D,A000,0180,0800,0010,11EA   ;2489           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 11EA, 0000,013C,0180,0800,0000,1042   ;2490           Z?
U 1042, 0001,203D,0180,09E8,0000,11A5   ;2491   =0      ERROR2,RC[0D]_Q                 ; CTR DID NOT ADVANCE
                                        ;2492
                                        ;2493   ;///////////////////////////////////////////////////////////////////////
                                        ;2494   ;+
                                        ;2495   ; CHECK THAT THE EXC PNT CTR DOES NOT COUNT WHEN "SRV+INV" IS ASSERTED.
                                        ;2496   ;-
                                        ;2497
U 1043, 0000,003C,0180,0A08,0000,1044   ;2498   T127S3: LAB_R[1]
U 1044, 0000,003D,0180,0800,0000,11BC   ;2499   =0      SUBTEST
U 1045, 0018,0014,1180,0A88,0000,1046   ;2500           R[1]_LA+K[.4]                   ; SET ADDRESS OF IB DATA
U 1046, 0818,0039,0180,0800,0000,11AF   ;2501   =0      D_K[.8],CALL,J/DC8              ; GENERATE EXPECTED ADDRESS
```

```
U 1047, 0001,003C,0180,09F0,0000,1048   ;2502           RC[0E]_D                          ; EQUALS 88
U 1048, 0000,003D,0180,0800,0000,11A2   ;2503   =0      ERLOOP
U 1049, 0000,003C,0180,0800,0000,104A   ;2504           NOP
U 104A, 2000,003D,0180,0A08,4200,11D7   ;2505   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 104B, 5000,003C,0180,0800,0000,11EB   ;2506           IBC7CLR.2.3
U 11EB, 5000,003C,0180,0800,0000,11EC   ;2507           IBC/CLR.2.3
U 11EC, 5000,003C,0180,0800,0000,11ED   ;2508           IBC/CLR.2.3
U 11ED, D000,003C,0180,0800,0000,104C   ;2509           IBC/CLR.1                         ; ...
U 104C, 0000,003D,0180,0800,0000,11D2   ;2510   =0      CALL,J/SETCM                      ; SET COMPATABILITY MODE
U 104D, 0000,003C,0180,0800,0000,1050   ;2511           NOP
U 1050, 0000,003D,0180,0800,0000,11D1   ;2512   =0      CALL,J/DISPAT                     ; EXC PNT CTR SHOULD NOT INCREMENT
U 1051, 0000,003C,3DF0,2C00,0000,11EE   ;2513           Q_ID[PSL]                         ; READ THE PSL
U 11EE, 0818,0038,4180,0800,0000,11EF   ;2514           D_K[.80]                          ; SETUP TO CLEAR CM BIT
U 11EF, 0B00,003C,0180,0800,0000,11F0   ;2515           D_D.SWAP
U 11F0, 081D,2024,0180,0800,0000,11F1   ;2516           D_Q.ANDNOT.D                      ; CLEAR THE CM BIT
U 11F1, 0000,003C,3D80,3C00,0000,1052   ;2517           ID[PSL]_D                         ; RESTORE THE PSL
U 1052, 0810,0039,0180,0970,0000,11D1   ;2518   =0      CALL,J/DISPAT,D_RC[0E]            ; CHECK THAT CTR DID NOT COUNT
U 1053, 001D,A000,0180,0800,0010,11F2   ;2519           ALU_Q-D,CLK.UBCC,BYTE
U 11F2, 0000,013C,0180,0800,0000,1054   ;2520           Z?
U 1054, 0001,203D,0180,09E8,0000,11A5   ;2521   =0      ERROR2,RC[0D]_Q                   ; EXC PNT CTR CHANGED
                                        ;2522
                                        ;2523   ;//////////////////////////////////////////////////////////////////////////
                                        ;2524   ;+
                                        ;2525   ; NOW CHECK THAT THE EXC PNT COUNTER ADVANCES IN COMPATABILITY MODE.
                                        ;2526   ;-
                                        ;2527
U 1055, 0810,0038,0180,0970,0000,11F3   ;2528   T127S4: D_RC[0E]
U 11F3, 0019,0000,0580,09F0,0000,1056   ;2529           RC[0E]_D-K[.1]                    ; SET EXPECTED ADDRESS = 87
U 1056, 0000,003D,0180,0800,0000,11BC   ;2530   =0      SUBTEST
U 1057, 0000,003C,0180,0800,0000,1058   ;2531           NOP
U 1058, 0000,003D,0180,0800,0000,11A2   ;2532   =0      ERLOOP
U 1059, 0000,003C,0180,0800,0000,105C   ;2533           NOP
U 105C, 2000,003D,0180,0A08,4200,11D7   ;2534   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 105D, 0000,003C,0180,0800,0000,1060   ;2535           NOP
U 1060, 0000,003D,0180,0800,0000,11D2   ;2536   =0      CALL,J/SETCM                      ; SET THE CM BIT IN THE PSL
U 1061, 0000,003C,0180,0800,0000,1062   ;2537           NOP
U 1062, 0000,003D,0180,0800,0000,11D1   ;2538   =0      CALL,J/DISPAT                     ; SHOULD ADVANCE THE EP COUNTER
U 1063, 0000,003C,3DF0,2C00,0000,11F4   ;2539           Q_ID[PSL]                         ; READ THE PSL
U 11F4, 0818,0038,4180,0800,0000,11F5   ;2540           D_K[.80]                          ; SETUP TO CLEAR THE CM BIT
U 11F5, 0B00,003C,0180,0800,0000,11F6   ;2541           D_D.SWAP
U 11F6, 081D,2024,0180,0800,0000,11F7   ;2542           D_Q.ANDNOT.D                      ; CLEAR THE CM BIT
U 11F7, 0000,003C,3D80,3C00,0000,1064   ;2543           ID[PSL]_D                         ; RELOAD THE PSL
U 1064, 0810,0039,0180,0970,0000,11D1   ;2544   =0      CALL,J/DISPAT,D_RC[0E]            ; SEE IF CTR WENT TO POINT 1
U 1065, 001D,A000,0180,0800,0010,11F8   ;2545           ALU_Q-D,CLK.UBCC,BYTE             ; CHECK THE ADDRESS
U 11F8, 0000,013C,0180,0800,0000,1066   ;2546           Z?
U 1066, 0001,203D,0180,09E8,0000,11A5   ;2547   =0      ERROR2,RC[0D]_Q                   ; CTR DID NOT ADVANCE
U 1067, 0000,003C,0180,0800,0000,1068   ;2548           NOP
```

```
                                     .PAGE   "TEST 128       COMPATABILITY MODE A FORK DECODE"
                                     ;**********************************************************************
                                     ;++
                                     ; TEST  128     COMPATABILITY MODE A FORK DECODE
                                     ;
                                     ; TEST DESCRIPTION
                                     ;       THIS TEST CHECKS THOSE OPCODES AND LOGIC THAT IS USED TO DECODE
                                     ;       A COMPATABILITY MODE INSTRUCTION ON THE A FORK. THE TEST OPERATES
                                     ;       BY LOADING THE IB WITH THE OPCODE, EXECUTING THE SUB/SPEC, AND CHECKING
                                     ;       THE ADDRESS THAT CAME OUT OF THE IB.
                                     ;
                                     ;       THERE ARE 26 OPCODES TESTED IN THIS TEST. THE DATA TABLE AT THE END
                                     ;       OF THIS TEST DESCRIBES WHAT CLASS EACH OF THE SETS OF OPCODES FALL
                                     ;       INTO AND THE LOOP COUNT FOR THOSE OPCODES.
                                     ;
                                     ; LOGIC DESCRIPTION
                                     ;       THIS TEST CHECKS THE LOGIC THAT DRIVES THE CM DECODE MULTIPLEXORS
                                     ;       AND THE MUX'S THEMSELVES, AND THE CM DECODE INPUTS TO THE DECODE
                                     ;       ADDRESS GATES ON THE IRC MODULE.
                                     ;
                                     ; ERROR DESCRIPTION
                                     ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                     ;             RECEIVED MICRO PC BITS <7:0>
                                     ;             LOOP COUNT -- INDICATES WHICH OPCODE IS CURRENTLY IN THE IB.
                                     ;
                                     ; SYNC POINT DESCRIPTION
                                     ;       ADDRESS SYNC00--IB ENABLES UPC BITS <7:0> AT THE INSTRUCTION FOLLOWING
                                     ;                    THIS ONE.
                                     ;--
                                     ;**********************************************************************
                                     =0
U 1068, 0000,003D,0180,0800,0000,118E  T128:   NEWTST
U 1069, 0018,0038,0D80,09F8,0000,11F9          RC[0F]_K[.3]                ; FOUR ARGUMENTS FOR TYPEOUT
U 11F9, 0818,0038,2180,0800,0000,106A          D_K[.14]                    ; GEN ADR OF IB DATA
U 106A, 0819,0015,0980,0800,0000,11A7  =0      D_D+K[.2],CALL,J/DCO        ; EQUALS 160(16)
U 106B, 0001,003C,0180,0A88,0000,106C          R[1]_D
U 106C, 0818,0039,E580,0800,0000,11A7  =0      D_K[.1A],CALL,J/DCO         ; GEN ADDRESS OF EXP ADDRESS
U 106D, 0001,003C,0180,0A80,0000,11FA          R[0]_D                      ; EQUALS 1A0(16)

                                     ;//////////////////////////////////////////;///////////////////////
                                     ;+
                                     ; START THE TEST
                                     ;-

U 11FA, 0018,0038,E580,09E0,0000,11FB  T128S1: RC[0C]_K[.1A]               ; SET THE LOOP COUNT
U 11FB, 0000,003C,0180,0A00,0200,11FC  T128L1: VA_R[0]                      ; FETCH THE EXPECTED ADDRESS
U 11FC, 0000,803C,0180,C800,0000,11FD          D[BYTE]_CACHE.P             ; ...
U 11FD, 0019,0034,4980,09F0,0000,106E          RC[0E]_D.AND.K[.FF]         ; SAVE
U 106E, 0000,003D,0180,0800,0000,11A2  =0      ERLOOP
U 106F, 0000,003C,0180,0800,0000,1070          NOP
U 1070, 2000,003D,0180,0A08,4200,11D7  =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1071, 0000,003C,0180,0800,0000,1072          NOP
U 1072, 0000,003D,0180,0800,0000,11D2  =0      CALL,J/SETCM
U 1073, 0810,0038,0180,0970,0000,1074          D_RC[0E]                    ; GET EXPECTED ADDRESS
U 1074, 0000,003D,0180,0800,0000,11D1  =0      CALL,J/DISPAT               ; EXECUTE THE CALL 3
```

```
U 1075, 001D,A000,0180,0800,0010,11FE   ;2604           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK ADDRESS
U 11FE, 0000,013C,0180,0800,0000,1076   ;2605           Z?                              ; BRANCH IF OK
U 1076, 0001,A03D,0180,09E8,0000,11A5   ;2606   =0      ERROR2,RC[0D]_Q,BYTE            ; A FORK ADDRESS WRONG
U 1077, 0000,003C,0180,0A00,0000,11FF   ;2607           LAB_R[0]
U 11FF, 0018,0014,0580,0A80,0000,1300   ;2608           R[0]_LA+K[.1]                   ; INCREMENT ADR OF EXP ADDRESS
U 1300, 0000,003C,0180,0A08,0000,1301   ;2609           LAB_R[1]
U 1301, 0018,0014,0980,0A88,0000,1302   ;2610           R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 1302, 0810,0038,0180,0960,0000,1303   ;2611           D_RC[0C]
U 1303, 0019,8000,0580,09E0,0010,1304   ;2612           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
U 1304, 0000,013C,0180,0800,0000,1078   ;2613           Z?
U 1078, 0000,003C,0180,0800,0000,11FB   ;2614   =0      J/T128L1
U 1079, 0000,003C,0180,0800,0000,107A   ;2615           NOP
                                        ;2616
                                        ;2617   ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2618   ;% 160
                                        ;2619   ;       BIN*-SMO*-DMO*EXC CT=0 (EXEC IS FALSE)
                                        ;2620   ; LOOP COUNT EQUALS 1A THRU 16
                                        ;2621   ;$ C388,2548,18E0,19D0,19C8
                                        ;2622   ; EQUIVALENT OCTAL DATA OF ABOVE HEX DATA:
                                        ;2623   ; 041610,022510,014340,014720,014710
                                        ;2624   ;
                                        ;2625   ;       -(BIN*EXC CT=0*-SMO)*-DMO (EXEC IS FALSE)
                                        ;2626   ; LOOP COUNT EQUALS 15 THRU 12
                                        ;2627   ;$ 0A0E,0A15,0A23,0A27
                                        ;2628   ; EQUIVALENT OCTAL DATA OF ABOVE HEX DATA:
                                        ;2629   ; 005016,005025,005043,005047
                                        ;2630   ;
                                        ;2631   ;       -(BIN*EXC CT=0*-SMO)*-DMO (EXEC IS FALSE)
                                        ;2632   ; LOOP COUNT EQUALS 11
                                        ;2633   ;$ 4027
                                        ;2634   ; EQUIVALENT OCTAL DATA OF ABOVE HEX DATA:
                                        ;2635   ; 040047
                                        ;2636   ;
                                        ;2637   ;       -SMO*BIN*-(IR 14:12=0)*EXEC TRUE(DMO*EXC CT=0)
                                        ;2638   ; LOOP COUNT EQUALS 10 THRU 0C
                                        ;2639   ;$ 1200,2400,4800,A200,1207
                                        ;2640   ; EQUIVALENT OCTAL DATA OF ABOVE HEX DATA:
                                        ;2641   ; 011000,022000,044000,121000,011007
                                        ;2642   ;
                                        ;2643   ;       SINGLE OP*EXEC TRUE(DMO*EXEC CT=0)
                                        ;2644   ; LOOP COUNT EQUALS 0B THRU 09
                                        ;2645   ;$ 8880,8900,0A00
                                        ;2646   ; EQUIVALENT OCTAL DATA OF THE ABOVE HEX DATA:
                                        ;2647   ; 104200,104400,005000
                                        ;2648   ;
                                        ;2649   ;       BYTE 1=0*EXEC TRUE(EXC CT=0*-BIN*-REG CLASS*-SINGLE OP)
                                        ;2650   ; LOOP COUNT EQUALS 08 THRU 01
                                        ;2651   ;$ 0008,0001,0002,0004,0010,0020,0040,0080
                                        ;2652   ; EQUIVALENT OCTAL DATA OF THE ABOVE HEX DATA
                                        ;2653   ; 000010,000001,000002,000004,000020,000040,000100,000200
                                        ;2654   ;
                                        ;2655   ; THE FOLLOWING IS THE EXPECTED ADDRESS FOR THE ABOVE TEST:
                                        ;2656   ;% 1A0
                                        ;2657   ;$ 1211,1C14,011C,0402,0C0C
                                        ;2658   ;       LOOP COUNT STARTS AT 10
                                        ;2659     ;$ 1211,1114,8811,5398
                                        ;2660     ;       LOOP COUNT STARTS AT 8
                                        ;2661     ;$ 9090,2250,9090,ABDD
                                        ;2662
                                        ;2663
                                        .PAGE   "TEST 129      COMPATABILITY MODE A FORK BRANCH INSTRUCTION DECODE"
                                        ;***********************************************************************
                                        ;++
                                        ; TEST  129     COMPATABILITY MODE A FORK BRANCH INSTRUCTION DECODE
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST CHECKS THOSE OPCODES THAT REQUIRE THE PSL CONDITION CODES
                                        ;       TO BE SETUP IN A SPECIFIC CONFIGURATION. THE TEST EXECUTES BY LOADING
                                        ;       THE INSTRUCTION BUFFER WITH THE OPCODE, LOADING THE CONDITION CODES
                                        ;       TO THE REQUIRED CONFIGURATION, AND EXECUTING THE SUB/SPEC, AND CHECKING
                                        ;       THE RESULTING ADDRESS.
                                        ;       THE DATA AT THE END OF THE TEST SHOWS THE OPCODE AND CONDITION CODE
                                        ;       VALUES THAT ARE USED FOR EACH PASS THRU THE LOOP.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS THE "BRANCH COND" SIGNALS FOR COMPATABILITY MODE
                                        ;       INSTRUCTIONS ON THE IRC MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                        ;             RECEIVED MICRO PC BITS <7:0>
                                        ;             LOOP COUNT -- INDICATES WHICH OPCODE IS BEING TESTED.
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       ADDRESS SYNC00-- THE MICRO PC BITS ARE ACTIVE AT THE INSTRUCTION
                                        ;                        FOLLOWING THIS ONE.
                                        ;--
                                        ;***********************************************************************
                                        =0
U 107A, 0000,003D,0180,0800,0000,118E   T129:   NEWTST
U 107B, 0018,0038,0D80,09F8,0000,1305           RC[0F]_K[.3]
U 1305, 0818,0038,E5C0,0800,0000,107C           D_K[.1A],Q_ALU
U 107C, 0819,0015,0980,0800,0000,11A7   =0      D_D+K[.2],CALL,J/DC0            ; GEN ADDRESS OF IB DATA
U 107D, 0C01,003C,0180,0A88,0000,107E           R[1]_D,D_Q                      ; EQUALS 1C0(16)
U 107E, 0819,0015,0D80,0800,0000,11B3   =0      D_D+K[.3],CALL,J/DCC            ; GEN ADDRESS OF EXPECTED ADDRESS
U 107F, 0001,003C,0180,0A80,0000,1080           R[0]_D                          ; EQUALS 1DC(16)
U 1080, 0818,0039,5180,0800,0000,11B3   =0      D_K[.1E],CALL,J/DCC             ; GEN ADDRESS OF COND CODE DATA
U 1081, 0001,003C,0180,0A90,0000,1306           R[2]_D                          ; EQUALS 1EC(16)

                                        ;///////////////////////////////////////;///////////////////////////////
                                        ;+
                                        ; START THE TEST
                                        ;-

U 1306, 0018,0038,8980,09E0,0000,1307   T129S1: RC[0C]_K[.D]                    ; SET THE LOOP COUNT
U 1307, 0000,003C,0180,0A00,0200,1308   T129L1: VA_R[0]                         ; FETCH EXPECTED ADDRESS
U 1308, 0000,803C,0180,C800,0000,1309           D[BYTE]_CACHE.P                 ; ...
U 1309, 0019,0034,4980,09F0,0000,130A           RC[0E]_D.AND.K[.FF]             ; SAVE
U 130A, 0000,003C,0180,0A10,0200,130B           VA_R[2]                         ; FETCH CONDITION CODE DATA
U 130B, 0000,803C,0180,C800,0000,130C           D[BYTE]_CACHE.P                 ; ...
U 130C, 0819,0034,6180,0A98,0000,1082           D_D.AND.K[.F],R[3]_ALU          ; MASK AND SAVE
U 1082, 0000,003D,0180,0800,0000,11A2   =0      ERLOOP
U 1083, 0800,003C,0180,0A18,0000,1084           D_R[3]                          ; GET CC DATA
U 1084, 2000,003D,0180,0A08,4200,11D7   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1085, 0000,003C,3DF0,2C00,0000,130D           Q_ID[PSL]                       ; GET THE PSL
```

```
U 130D, 0019,2024,61C0,0800,0000,130E   ;2719           Q_Q.ANDNOT.K[.F]                ; MASK THE PSL
U 130E, 081D,0030,0180,0800,0000,130F   ;2720           D_D.OR.Q                        ; INSERT CC'S
U 130F, 0000,003C,3D80,3C00,0000,1086   ;2721           ID[PSL]_D                       ; LOAD THE CC'S
U 1086, 0000,003D,0180,0800,0000,11D2   ;2722   =0      CALL,J/SETCM
U 1087, 0810,0038,0180,0970,0000,1088   ;2723           D_RC[0E]                        ; GET EXPECTED DATA
U 1088, 0000,003D,0180,0800,0000,11D1   ;2724   =0      CALL,J/DISPAT                   ; EXECUTE TEH CALL 3
U 1089, 001D,A000,0180,0800,0010,1310   ;2725           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 1310, 0000,013C,0180,0800,0000,108A   ;2726           Z?
U 108A, 0001,A03D,0180,09E8,0000,11A5   ;2727   =0      ERROR2,RC[0D]_Q,BYTE            ; A FORK FAILED
U 108B, 0000,003C,0180,0A00,0000,1311   ;2728           LAB_R[0]
U 1311, 0018,0014,0580,0A80,0000,1312   ;2729           R[0]_LA+K[.1]                   ; INCREMENT ADR OF EXP ADDRESS
U 1312, 0000,003C,0180,0A08,0000,1313   ;2730           LAB_R[1]
U 1313, 0018,0014,0980,0A88,0000,1314   ;2731           R[1]_LA+K[.2]                   ; INCREMNT ADR OF IB DATA
U 1314, 0000,003C,0180,0A10,0000,1315   ;2732           LAB_R[2]
U 1315, 0018,0014,0580,0A90,0000,1316   ;2733           R[2]_LA+K[.1]                   ; INCREMENT ADR OF CC DATA
U 1316, 0810,0038,0180,0960,0000,1317   ;2734           D_RC[0C]
U 1317, 0019,8000,0580,09E0,0010,1318   ;2735           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
U 1318, 0000,013C,0180,0800,0000,108C   ;2736           Z?
U 108C, 0000,003C,0180,0800,0000,1307   ;2737   =0      J/T129L1
U 108D, 0000,003C,0180,0800,0000,108E   ;2738           NOP
                                        ;2739
                                        ;2740
                                        ;2741   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2742   ;% 1C0
                                        ;2743   ; LOOP COUNT EQUALS 0D THRU 07
                                        ;2744   ;$ 8200,8200,8200,8000,8000,8400,8400
                                        ;2745   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                        ;2746   ; 101000,101000,101000,100000,100000,102000,102000
                                        ;2747   ;
                                        ;2748   ; LOOP COUNT EQUALS 06 THRU 01
                                        ;2749   ;$ 0400,0400,0400,0200,0200,0100
                                        ;2750   ; OCTAL EQUIVALENT OF THE ABOVE HEX DATA:
                                        ;2751   ; 002000,002000,002000,001000,001000,000400
                                        ;2752   ;
                                        ;2753   ; THE FOLLOWING IS THE EXPECTED ADDRESS FOR THE ABOVE TEST:
                                        ;2754   ;% 1DC
                                        ;2755   ;$ A1A0,A0A1,A0A1,A2A1,A0A2,A0A2,00A6
                                        ;2756   ;
                                        ;2757   ; THE FOLLOWING IS THE CONDITION CODE DATA FOR THE ABOVE TEST:
                                        ;2758   ;% 1EC
                                        ;2759   ; EACH PASS THRU THE LOOP USES ONE BYTE OF THIS DATA
                                        ;2760   ;$ 0100,0004,0008,0802,0002,0004,0000
                                        ;2761
                                        ;2762
```

```
                                           .PAGE   "TEST 12A      COMPATABILITY MODE B FORK DECODE"
                                           ;***********************************************************************
                                           ;++
                                           ; TEST  12A     COMPATABILITY MODE B FORK DECODE
                                           ;
                                           ; TEST DESCRIPTION
                                           ;       THIS TEST CHECKS 22 OPCODES WITH THE EXECUTION POINT COUNTER
                                           ;       EQUAL TO 1. THIS IS DONE BY LOADING THE IB WITH THE OPCODE, EXECUTING
                                           ;       A SUB/SPEC FUNCTION TO ADVANCE THE EXECUTION POINT COUNTER TO 1, THEN
                                           ;       EXECUTING ANOTHER SUB/SPEC AND CHECKING THE ADDRESS.
                                           ;       THE DATA TABLE AT THE END OF THIS TEST DESCRIBES THE LOGICAL DECODE
                                           ;       OF THE OPCODES.
                                           ;
                                           ; LOGIC DESCRIPTION
                                           ;       THIS TEST CHECKS MORE OF THE LOGIC THAT FEEDS THE "CM DECODE
                                           ;       MULTIPLEXORS" ON THE IRC MODULE.
                                           ;
                                           ; ERROR DESCRIPTION
                                           ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                           ;             RECEIVED MICRO PC BITS <7:0>
                                           ;             LOOP COUNT -- DESCRIBES WHICH OPCODE IS BEING TESTED.
                                           ;
                                           ; SYNC POINT DESCRIPTION
                                           ;       ADDRESS SYNC00--THE MICRO PC BITS ARE VALID AT THE INSTRUCTION
                                           ;                       FOLLOWING THIS ONE.
                                           ;--
                                           ;***********************************************************************
                                           =0
U 108E, 0000,003D,0180,0800,0000,118E      T12A:   NEWTST
U 108F, 0018,0038,0D80,09F8,0000,1090              RC[0F]_K[.3]                ; FOUR ARGUMENTS FOR TYPEOUT
U 1090, 0818,0039,7580,0800,0000,11A7      =0      D_K[.20],CALL,J/DC0         ; GEN ADDRESS OF IB DATA
U 1091, 0001,003C,0180,0A88,0000,1319              R[1]_D                      ; EQUALS 200(16)
U 1319, 0818,0038,E980,0800,0000,1092              D_K[.24]
U 1092, 0819,0001,0580,0800,0000,11A7      =0      D_D-K[.1],CALL,J/DC0        ; GEN ADDRESS OF EXP ADDRESS
U 1093, 0001,003C,0180,0A80,0000,131A              R[0]_D                      ; EQUALS 230(16)

                                           ;//////////////////////////////////////////////////////////////////////
                                           ;+
                                           ; START THE TEST
                                           ;-

U 131A, 0818,0038,2180,0800,0000,131B      T12AS1: D_K[.14]
U 131B, 0019,0014,0980,09E0,0000,131C              RC[0C]_D+K[.2]              ; SET THE LOOP COUNT
U 131C, 0000,003C,0180,0A00,0200,131D      T12AL1: VA_R[0]                     ; FETCH THE EXPECTED ADDRESS
U 131D, 0000,803C,0180,C800,0000,131E              D[BYTE]_CACHE.P             ; ...
U 131E, 0019,0034,4980,09F0,0000,1094              RC[0E]_D.AND.K[.FF]         ; SAVE
U 1094, 0000,003D,0180,0800,0000,11A2      =0      ERLOOP
U 1095, 0000,003C,0180,0800,0000,1096              NOP
U 1096, 2000,003D,0180,0A08,4200,11D7      =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1097, 0000,003C,0180,0800,0000,1098              NOP
U 1098, 0000,003D,0180,0800,0000,11D2      =0      CALL,J/SETCM
U 1099, 0810,0038,0180,0970,0000,109A              D_RC[0E]                    ; GET EXPECTED DATA
U 109A, 0000,003D,0180,0800,0000,11D1      =0      CALL,J/DISPAT               ; EXECUTE THE A FORK
U 109B, 0000,003C,0180,0800,0000,109C              NOP
U 109C, 0000,003D,0180,0800,0000,11D1      =0      CALL,J/DISPAT               ; EXECUTE THE B FORK
```

```
U 109D, 001D,A000,0180,0800,0010,131F   ;2818           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 131F, 0000,013C,0180,0800,0000,109E   ;2819           Z?
U 109E, 0001,A03D,0180,09E8,0000,11A5   ;2820   =0      ERROR2,RC[OD]_Q,BYTE            ; B FORK FAILED
U 109F, 0000,003C,0180,0A00,0000,1320   ;2821           LAB_R[0]
U 1320, 0018,0014,0580,0A80,0000,1321   ;2822           R[0]_LA+K[.1]                   ; INCREMENT ADR OF EXP ADDRESS
U 1321, 0000,003C,0180,0A08,0000,1322   ;2823           LAB_R[1]
U 1322, 0018,0014,0980,0A88,0000,1323   ;2824           R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 1323, 0810,0038,0180,0960,0000,1324   ;2825           D_RC[OC]
U 1324, 0019,8000,0580,09E0,0010,1325   ;2826           RC[OC]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
U 1325, 0000,013C,0180,0800,0000,10A0   ;2827           Z?
U 10A0, 0000,003C,0180,0800,0000,131C   ;2828   =0      J/T12AL1
U 10A1, 0000,003C,0180,0800,0000,10A2   ;2829           NOP
                                        ;2830
                                        ;2831   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2832   ;% 200
                                        ;2833   ;        EXC CT=1*DMO*-SMO*BIN*SRC R=PC*SM2
                                        ;2834   ; LOOP COUNT EQUALS 16 THRU 13
                                        ;2835   ;$ 95C7,65C7,55C7,25C7
                                        ;2836   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                        ;2837   ; 112707,062707,052707,022707
                                        ;2838   ;
                                        ;2839   ;        EXC CT=1*DMO*-SMO*BIN*-SRC R=PC*SM2
                                        ;2840   ; LOOP COUNT EQUALS 12
                                        ;2841   ;$ 9407
                                        ;2842   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                        ;2843   ; 112007
                                        ;2844   ;
                                        ;2845   ;        -(EXC CT=0*-SMO*BIN)*SRC R=PC*-SM2*DMO
                                        ;2846   ; LOOP COUNT EQUALS 11 THRU OF
                                        ;2847   ;$ 9DC7,93C7,99C7
                                        ;2848   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                        ;2849   ; 116707,111707,114707
                                        ;2850   ;
                                        ;2851   ;        BIN*EXEC TRUE(EXC CT=1*SMO)
                                        ;2852   ; LOOP COUNT EQUALS OE
                                        ;2853   ;$ 5000
                                        ;2854   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                        ;2855   ; 050000
                                        ;2856   ;
                                        ;2857   ;        -DMO*EXEC TRUE(EXC CT=1*REG CLASS)
                                        ;2858   ; LOOP COUNT EQUALS OD THRU OC
                                        ;2859   ;$ 7608,7808
                                        ;2860   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                        ;2861   ; 073010,074010
                                        ;2862   ;
                                        ;2863   ;        -SMO*EXEC FALSE(EXC CT=1*BIN)
                                        ;2864   ; LOOP COUNT EQUALS OB THRU 05
                                        ;2865   ;$ 3608,5608,1608,F608,7E08,7A08,7C08
                                        ;2866   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                        ;2867   ; 033010,053010,013010,073010,077010,075010,076010
                                        ;2868   ;
                                        ;2869   ;        -SMO*-DMO*EXEC TRUE(EXC CT=1*SINGLE OP)
                                        ;2870   ; LOOP COUNT EQUALS 04 THRU 01
                                        ;2871   ;$ 0BC8,0C08,8988,8C48
                                        ;2872   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
```

```
;2873    ; 005710,006010,104610,106110
;2874    ;
;2875    ;
;2876    ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
;2877    ;% 230
;2878    ;$ F4F9,BFF4,F9F9,F9F9,AC74,0164,0101,0101
;2879    ;$ 0101,C72F,E401
;2880
;2881
```

```
                                              ;2882   .PAGE   "TEST 12B       COMPATABILITY MODE C FORK DECODE"
                                              ;2883   ;********************************************************************
                                              ;2884   ;++
                                              ;2885   ; TEST  12B     COMPATABILITY MODE C FORK DECODE
                                              ;2886   ;
                                              ;2887   ; TEST DESCRIPTION
                                              ;2888   ;       THIS TEST CHECKS THAT THE "EXEC" SIGNAL GOES TRUE WHEN THE
                                              ;2889   ;       EXECUTION POINT COUNTER EQUALS 2. THIS IS DONE BY LOADING THE
                                              ;2890   ;       IB WITH AN OPCODE, EXECUTING TWO SUB/SPEC TO ADVANCE THE EXECUTION
                                              ;2891   ;       POINT COUNTER TO 2, AND THEN EXECUTING ANOTHER SUB/SPEC AND CHECKING
                                              ;2892   ;       THE ADDRESS.
                                              ;2893   ;
                                              ;2894   ; LOGIC DESCRIPTION
                                              ;2895   ;       THIS TEST CHECKS PART OF THE GATE THAT GENERATES THE "EXEC" SIGNAL
                                              ;2896   ;       ON THE IRC MODULE.
                                              ;2897   ;
                                              ;2898   ; ERROR DESCRIPTION
                                              ;2899   ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                              ;2900   ;             RECEIVED MICRO PC BITS <7:0>
                                              ;2901   ;
                                              ;2902   ; SYNC POINT DESCRIPTION
                                              ;2903   ;       ADDRESS SYNC00--MICRO PC BITS <7:0> ARE ACTIVE AT THE INSTRUCTION
                                              ;2904   ;                       FOLLOWING THIS ONE.
                                              ;2905   ;--
                                              ;2906   ;******************************************************************
                                              ;2907   =0
U 10A2, 0000,003D,0180,0800,0000,118E         ;2908   T12B:   NEWTST
U 10A3, 0018,0038,0980,09F8,0000,1326         ;2909           RC[0F]_K[.2]
U 1326, 0818,0038,E980,0800,0000,10A4         ;2910           D_K[.24]
U 10A4, 0819,0015,05C0,0800,0000,11A7         ;2911   =0      D_D+K[.1],CALL,J/DC0,Q_ALU      ; GEN ADDRESS OF IB DATA
U 10A5, 0001,003C,0180,0A88,0000,1327         ;2912           R[1]_D                          ; EQUALS 250(16)
U 1327, 0818,0038,7580,0800,0000,1328         ;2913           D_K[.20]                        ; GEN EXPECTED DISPATCH ADDRESS
U 1328, 0000,003C,6180,0800,0000,1329         ;2914           KMX/.F
U 1329, 0019,0014,6180,09F0,0000,10A6         ;2915           RC[0E]_D+K[.F]                  ; SAVE
                                              ;2916
                                              ;2917   ;/////////////////////////////////////////////////////////////////
                                              ;2918   ;+
                                              ;2919   ; START THE TEST
                                              ;2920   ;-
                                              ;2921
U 10A6, 0000,003D,0180,0800,0000,11A2         ;2922   =0      ERLOOP
U 10A7, 0000,003C,0180,0800,0000,10A8         ;2923           NOP
U 10A8, 2000,003D,0180,0A08,4200,11D7         ;2924   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10A9, 0000,003C,0180,0800,0000,10AA         ;2925           NOP
U 10AA, 0000,003D,0180,0800,0000,11D2         ;2926   =0      CALL,J/SETCM
U 10AB, 0810,0038,0180,0970,0000,10AC         ;2927           D_RC[0E]
U 10AC, 0000,003D,0180,0800,0000,11D1         ;2928   =0      CALL,J/DISPAT                   ; EXECUTE A FORK
U 10AD, 0000,003C,0180,0800,0000,10AE         ;2929           NOP
U 10AE, 0000,003D,0180,0800,0000,11D1         ;2930   =0      CALL,J/DISPAT                   ; EXECUTE B FORK
U 10AF, 0000,003C,0180,0800,0000,10B0         ;2931           NOP
U 10B0, 0000,003D,0180,0800,0000,11D1         ;2932   =0      CALL,J/DISPAT                   ; EXECUTE THE C FORK
U 10B1, 001D,A000,0180,0800,0010,132A         ;2933           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 132A, 0000,013C,0180,0800,0000,10B2         ;2934           Z?
U 10B2, 0001,A03D,0180,09E8,0000,11A3         ;2935   =0      ERROR1,RC[0D]_Q,BYTE            ; C FORK FAILED
U 10B3, 0000,003C,0180,0800,0000,10B4         ;2936           NOP
```

```
;2937
;2938    ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
;2939    ;% 250
;2940    ;          -DMO*EXEC TRUE(EXC CT=2)
;2941    ;$ 3008
;2942    ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
;2943    ; 030010
;2944
;2945
```

```
                                              ;2946   .PAGE   "TEST 12C       COMPATABILITY MODE STALL LOGIC"
                                              ;2947   ;*********************************************************************
                                              ;2948   ;++
                                              ;2949   ; TEST  12C     COMPATABILITY MODE STALL LOGIC
                                              ;2950   ;
                                              ;2951   ; TEST DESCRIPTION
                                              ;2952   ;       THIS TEST CHECKS THE TWO CONDITIONS THAT ARE UNIQUE TO COMPATABILITY
                                              ;2953   ;       MODE THAT CAN CAUSE THE IB TO STALL.
                                              ;2954   ;
                                              ;2955   ;       SUBTST 1 - CHECK THAT BYTE 1 INVALID AND "NOT EXEC" CAUSES A STALL.
                                              ;2956   ;       SUBTST 2 - CHECK THAT BYTE 2 INVALID AND AN INSTRUCTION WITH A PC
                                              ;2957   ;                  MODE CAUSES A STALL.
                                              ;2958   ;
                                              ;2959   ; LOGIC DESCRIPTION
                                              ;2960   ;       THIS TEST CHECKS PART OF THE LOGIC THAT GENERATES "STALL+SVC"
                                              ;2961   ;       ON THE IRC MODULE.
                                              ;2962   ;
                                              ;2963   ; ERROR DESCRIPTION
                                              ;2964   ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                              ;2965   ;             RECEIVED MICRO PC BITS <7:0>
                                              ;2966   ;
                                              ;2967   ; SYNC POINT DESCRIPTION
                                              ;2968   ;       ADDRESS SYNC00--MICRO PC BITS ARE VALID AT THE INSTRUCTION FOLLOWING
                                              ;2969   ;                       THIS ONE.
                                              ;2970   ;--
                                              ;2971   ;*******************************************************************
                                              ;2972   =0
U 10B4, 0000,003D,0180,0800,0000,118E         ;2973   T12C:   NEWTST
U 10B5, 0018,0038,0980,09F8,0000,132B         ;2974           RC[0F]_K[.2]
U 132B, 0818,0038,7580,0800,0000,132C         ;2975           D_K[.20]
U 132C, 0000,003C,F580,0800,0000,10B6         ;2976           KMX/.A                          ; GEN ADR OF IB DATA
U 10B6, 0819,0015,F580,0800,0000,11B5         ;2977   =0      D_D+K[.A],CALL,J/DCE            ; EQUALS 2AE(16)
U 10B7, 0001,003C,0180,0A88,0000,10B8         ;2978           R[1]_D                  ; SAVE
U 10B8, 0000,003D,0180,0800,0000,11BC         ;2979   =0      SUBTEST
U 10B9, 0818,0038,9D80,0800,0000,132D         ;2980           D_K[.7C]                        ; GEN STALL ADDRESS
U 132D, 0019,0014,0980,09F0,0000,10BA         ;2981           RC[0E]_D+K[.2]                  ; EQUALS 7E(16)
                                              ;2982
                                              ;2983   ;///////////////////////////////////////////////////////////////////
                                              ;2984   ;+
                                              ;2985   ; CHECK THAT BYTE 1 INVALID CAUSES A STALL
                                              ;2986   ;-
                                              ;2987
                                              ;2988   T12CS1:
U 10BA, 0000,003D,0180,0800,0000,11A2         ;2989   =0      ERLOOP
U 10BB, 0000,003C,0180,0800,0000,10BC         ;2990           NOP
U 10BC, 2000,003D,0180,0A08,4200,11DE         ;2991   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAITONCE ; READ 2 BYTES
U 10BD, 0000,003C,0180,0800,0000,10BE         ;2992           NOP
U 10BE, 0000,003D,0180,0800,0000,11D2         ;2993   =0      CALL,J/SETCM                    ; SET CM BIT
U 10BF, 0810,0038,0180,0970,0000,132E         ;2994           D_RC[0E]
U 132E, D000,003C,0180,0800,0000,10C0         ;2995           IBC/CLR.1                       ; MAKE BYTE 1 INVALID
U 10C0, 0000,003D,0180,0800,0000,11D1         ;2996   =0      CALL,J/DISPAT                   ; EXECUTE TEH A FORK
U 10C1, 001D,A000,0180,0800,0010,132F         ;2997           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 132F, 0000,013C,0180,0800,0000,10C2         ;2998           Z?
U 10C2, 0001,A03D,0180,09E8,0000,11A3         ;2999   -0      ERROR1,RC[0D]_Q,BYTE            ; STALL FAILED
                                              ;3000
```

```
                                            ;//////////////////////////////////////////////////////////////////////////
                                            ;+
                                            ; NOW CHECK THAT BYTE 2 INVALID CAUSES STALL
                                            ;-

U 10C3, 0000,003C,0180,0A08,0000,10C4       T12CS2: LAB_R[1]
U 10C4, 0000,003D,0180,0800,0000,11BC       =0      SUBTEST
U 10C5, 0018,0014,1180,0A88,0000,10C6               R[1]_LA+K[.4]                  ; INCREMENT ADR OF IB DATA
U 10C6, 0000,003D,0180,0800,0000,11A2       =0      ERLOOP
U 10C7, 0000,003C,0180,0800,0000,10C8               NOP
U 10C8, 2000,003D,0180,0A08,4200,11DE       =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAITONCE ; LOAD 2 BYTES
U 10C9, 0000,003C,0180,0800,0000,10CA               NOP
U 10CA, 0000,003D,0180,0800,0000,11D2       =0      CALL,J/SETCM                   ; SET CM BIT
U 10CB, 0810,0038,0180,0970,0000,10CC               D_RC[0E]
U 10CC, 0000,003D,0180,0800,0000,11D1       =0      CALL,J/DISPAT                  ; EXECUTE THE CALL 3
U 10CD, 001D,A000,0180,0800,0010,1330               ALU_Q-D,CLK.UBCC,BYTE          ; CHECK
U 1330, 0000,013C,0180,0800,0000,10CE               Z?
U 10CE, 0001,A03D,0180,09E8,0000,11A3       =0      ERROR1,RC[0D]_Q,BYTE           ; STALL FAILED
U 10CF, 0000,003C,0180,0800,0000,10D0               NOP

                                            ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                            ;% 2AE
                                            ; SUBTEST 1
                                            ;$ 0000
                                            ;
                                            ;% 2B2
                                            ; SUBTEST 2
                                            ;$ 15DF
                                            ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                            ; 012757
```

```
                                        ;3033   .PAGE   "TEST 12D       COMPATABILITY MODE D MUX SELECT"
                                        ;3034   ;**************************************************************************
                                        ;3035   ;++
                                        ;3036   ; TEST  12D     COMPATABILITY MODE D MUX SELECT
                                        ;3037   ;
                                        ;3038   ; TEST DESCRIPTION
                                        ;3039   ;       THIS TEST CHECKS 20 OPCODES AND THEIR RESPECTIVE D MUX DATA.
                                        ;3040   ;       THE TEST DATA AT THE END OF THIS TEST DESCRIBES THE OPCODES.
                                        ;3041   ;
                                        ;3042   ;       SUBTST 1 - CHECK 15 OPCODES AT EXECUTION POINT 0
                                        ;3043   ;       SUBTST 2 - CHECK 1 OP CODE AT EXECUTION POINT 1
                                        ;3044   ;       SUBTST 3 - CHECK 4 OP CODES AT EXECUTION POINT 4
                                        ;3045   ;                  THE IB DATA AND EXPECTED DATA FOR THIS TEST IS
                                        ;3046   ;                  AT THE END OF THIS OVERLAY.
                                        ;3047   ;
                                        ;3048   ;       NOTE: SUBTEST 3 DATA IS AT THE END OF TEST 12F.
                                        ;3049   ;
                                        ;3050   ; LOGIC DESCRIPTION
                                        ;3051   ;       THIS TEST CHECKS THE LOGIC THAT GENERATES THE SELECT BYTE AND
                                        ;3052   ;       SELECT WORD SIGNALS ON THE IRC MODULE IN COMPATABILITY MODE.
                                        ;3053   ;
                                        ;3054   ; ERROR DESCRIPTION
                                        ;3055   ;       DATA: EXPECTED D MUX DATA
                                        ;3056   ;             RECEIVED D MUX DATA
                                        ;3057   ;             LOOP COUNT -- DESCRIBES WHICH OPCODE IS CURRENTLY IN THE IB.
                                        ;3058   ;
                                        ;3059   ; SYNC POINT DESCRIPTION
                                        ;3060   ;       SUBTST 1 - SYNC02--D MUX IS READ INTO THE Q REGISTER
                                        ;3061   ;       SUBTST 2 - SYNC06--D MUX IS READ INTO THE Q REGISTER
                                        ;3062   ;--
                                        ;3063   ;*************************************************************************
                                        ;3064   =0
U 10D0, 0000,003D,0180,0800,0000,118E   ;3065   T12D:   NEWTST
U 10D1, 0018,0038,0D80,09F8,0000,1331   ;3066           RC[0F]_K[.3]
U 1331, 0818,0038,E980,0800,0000,10D2   ;3067           D_K[.24]                        ; GEN ADR OF IB DATA
U 10D2, 0819,0015,0180,0800,0000,11A7   ;3068   =0      D_D+K[.8],CALL,J/DC0            ; EQUALS 2C0(16)
U 10D3, 0001,003C,0180,0A88,0000,1332   ;3069           R[1]_D                          ; SAVE
U 1332, 0818,0038,7980,0800,0000,10D4   ;3070           D_K[.30]                        ; GEN ADR OF EXPECTED DATA
U 10D4, 0819,0015,1180,0800,0000,11A7   ;3071   =0      D_D+K[.4],CALL,J/DC0            ; EQUALS 330(16)
U 10D5, 0001,003C,0180,0A80,0000,1333   ;3072           R[0]_D
                                        ;3073
                                        ;3074   ;/////////////////////////////////////////////////////////////////////////
                                        ;3075   ;+
                                        ;3076   ; START THE TEST
                                        ;3077   ;-
                                        ;3078
U 1333, 0018,0038,6180,09E0,0000,10D6   ;3079   T12DS1: RC[0C]_K[.F]                    ; SET THE LOOP COUNT
U 10D6, 0000,003D,0180,0800,0000,11BC   ;3080   =0      SUBTEST
U 10D7, 0000,003C,0180,0A00,0200,1334   ;3081   T12DL1: VA_R[0]                         ; LOAD ADR OF EXP DATA
U 1334, 0000,003C,0180,C800,0000,1335   ;3082           D[LONG]_CACHE.P                 ; FETCH THE EXPECTED DATA
U 1335, 0001,003C,0180,09F0,0000,10D8   ;3083           RC[0E]_D                        ; SAVE
U 10D8, 0000,003D,0180,0800,0000,11A2   ;3084   =0      ERLOOP
U 10D9, 0000,003C,0180,0800,0000,10DA   ;3085           NOP
U 10DA, 2000,003D,0180,0A08,4200,11D7   ;3086   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10DB, 0000,003C,0180,0800,0000,10DC   ;3087           NOP
```

```
U 10DC, 0000,003D,0180,0800,0000,11D2   ;3088   =0      CALL,J/SETCM                        ; TURN ON CM
U 10DD, 0810,0038,0180,0970,0000,1336   ;3089           D_RC[OE]
U 1336, 0000,003C,01F0,2C00,0000,1337   ;3090   SYNC02: Q_ID[IBUF]                          ; READ THE D MUX
U 1337, 001D,2000,0180,0800,0010,1338   ;3091           ALU_Q-D,CLK.UBCC                    ; CHECK
U 1338, 0000,013C,0180,0800,0000,10DE   ;3092           Z?
U 10DE, 0001,203D,0180,09E8,0000,11A5   ;3093   =0      ERROR2,RC[OD]_Q                     ; D MUX FAILED
U 10DF, 0000,003C,0180,0A00,0000,1339   ;3094           LAB_R[0]
U 1339, 0018,0014,1180,0A80,0000,133A   ;3095           R[0]_LA+K[.4]                       ; INCREMENT ADR OF EXP DATA
U 133A, 0000,003C,0180,0A08,0000,133B   ;3096           LAB_R[1]
U 133B, 0018,0014,0180,0A88,0000,133C   ;3097           R[1]_LA+K[.8]                       ; INCREMENT ADR OF IB DATA
U 133C, 0810,0038,0180,0960,0000,133D   ;3098           D_RC[OC]
                                        ;3099           RC[OC]_D-K[.1],D_ALU,
U 133D, 0819,8000,0580,09E0,0010,133E   ;3100                   CLK.UBCC,BYTE               ; CHECK THE LOOP COUNT
U 133E, 0000,013C,0180,0800,0000,10E0   ;3101           Z?
U 10E0, 0000,003C,8580,0800,0000,133F   ;3102   =0      J/T12D_S1_ECO,K[.C]
U 10E1, 0000,003C,0180,0800,0000,10E4   ;3103           J/T12DS2                            ; GO TO NEXT SUBTEST
                                        ;3104   T12D_S1_ECO:
U 133F, 0019,8000,8580,0800,0010,1340   ;3105           ALU_D-K[.C],CLK.UBCC,BYTE           ; AT "TWINKLE" PATTERNS?
U 1340, 0000,013C,0180,0800,0000,10E2   ;3106           Z?
U 10E2, 0000,003C,0180,0800,0000,10D7   ;3107   =0      J/T12DL1                            ; BRANCH IF NO
                                        ;3108     ;
                                        ;3109     ; CHECK IF THIS SYSTEM HAS BEEN ECO'D
                                        ;3110     ;
U 10E3, 0000,003C,0180,0800,0000,1008   ;3111           NOP
U 1008, 0000,003D,0180,0800,0000,11C9   ;3112   =00     CALL[CHECK_TWINKLE]                 ; CHECK FOR TWINKLE ECO
U 1009, 0000,003C,0180,0800,0000,10D7   ;3113           J/T12DL1                            ; BRANCH IF ECO INSTALLED
                                        ;3114     ;
                                        ;3115     ; MACHINE IS NOT "TWINKLED", SKIP 3 TEST PATTERNS
                                        ;3116     ;
U 100A, 0019,0000,0D80,09E0,0000,1341   ;3117           RC[OC]_D-K[.3]                      ; FIXUP LOOP COUNT
U 1341, 0000,003C,8580,0A00,0000,1342   ;3118   =       LAB_R[0],K[.C]                      ; FIXUP ADDRESS OF EXPECTED DATA
U 1342, 0018,0014,8580,0A80,0000,1343   ;3119           R[0]_LA+K[.C]                       ; ...
U 1343, 0000,003C,0180,0A08,0000,1344   ;3120           LAB_R[1]                            ; FIXUP ADDRESS OF IB DATA
U 1344, 0018,0014,7D80,0A88,0000,10D7   ;3121           R[1]_LA+K[.18],J/T12DL1             ; AND CONTINUE TEST
                                        ;3122
                                        ;3123   ;//////////////////////////////////////////////////////////////////////
                                        ;3124   ;+
                                        ;3125   ; CHECK THE OPCODE THAT REQUIRES THE EXECUTION POINT COUNTER TO BE NON ZERO.
                                        ;3126   ;-
                                        ;3127
                                        ;3128   =0
U 10E4, 0000,003D,0180,0800,0000,11BC   ;3129   T12DS2: SUBTEST
U 10E5, 0000,003C,0180,0A00,0200,1345   ;3130           VA_R[0]                             ; LOAD ADDRESS OF EXPECTED DATA
U 1345, 0000,003C,0180,C800,0000,1346   ;3131           D[LONG]_CACHE.P                     ; READ THE EXPECTED DATA
U 1346, 0001,003C,0180,09F0,0000,10E6   ;3132           RC[OE]_D                            ; SAVE
U 10E6, 0000,003D,0180,0800,0000,11A2   ;3133   =0      ERLOOP
U 10E7, 0000,003C,0180,0800,0000,10E8   ;3134           NOP
U 10E8, 2000,003D,0180,0A08,4200,11D7   ;3135   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10E9, 0000,003C,0180,0800,0000,10EA   ;3136           NOP
U 10EA, 0000,003D,0180,0800,0000,11D2   ;3137   =0      CALL,J/SETCM                        ; SET THE CM BIT
U 10EB, 0810,0038,0180,0970,0000,10EC   ;3138           D_RC[OE]                            ; GET EXPECTED D MUX DATA
U 10EC, 0000,003D,0180,0800,0000,11D1   ;3139   =0      CALL,J/DISPAT                       ; GO TO EXEC PT 1
U 10ED, 0000,003C,01F0,2C00,0000,1347   ;3140   SYNC06: Q_ID[IBUF]                          ; READ THE D MUX
U 1347, 001D,2000,0180,0800,0010,1348   ;3141           ALU_Q-D,CLK.UBCC                    ; CHECK
U 1348, 0000,013C,0180,0800,0000,10EE   ;3142           Z?
```

```
U 10EE, 0001,203D,0180,09E8,0000,11A5   ;3143   =0      ERROR2,RC[0D]_Q                 ; D MUX SELECT FAILED
U 10EF, 0000,003C,0180,0800,0000,10F0   ;3144           NOP
                                        ;3145
                                        ;3146
                                        ;3147   ;//////////////////////////////////////////////////////////////////
                                        ;3148   ;+
                                        ;3149   ; CHECK 4 OPCODES THAT REQUIRE THE EXECUTION POINT COUNTER TO BE AT 4
                                        ;3150   ;-
                                        ;3151
                                        ;3152   =0
U 10F0, 0000,003D,0180,0800,0000,11BC   ;3153   T12DS3: SUBTEST
U 10F1, 0000,003C,3DF0,2C00,0000,1349   ;3154           Q_ID[PSL]                       ; CLEAR THE COMPATABILITY
U 1349, 0000,003C,8D80,0800,0084,734A   ;3155           SC_K[.1F]                       ; MODE BIT IN THE
U 134A, 0801,2034,0180,0800,0000,134B   ;3156           D_Q.AND.MASK                    ; PSL
U 134B, 0000,003C,3D80,3C00,0000,134C   ;3157           ID[PSL]_D                       ; ...
U 134C, 0018,0038,1180,09E0,0000,134D   ;3158           RC[0C]_K[.4]                    ; SET THE LOOP COUNT
U 134D, 0818,0038,3180,0800,0000,10F2   ;3159           D_K[.40]                        ; GENERATE ADDRESS OF IB DATA
U 10F2, 0819,0015,0580,0800,0000,11A7   ;3160   =0      D_D+K[.1],CALL[DC0]             ; EQUALS 410(H)
U 10F3, 0001,003C,7580,0A80,0000,134E   ;3161           R[0]_D,KMX/.20                  ; SAVE
U 134E, 0019,0014,7580,0800,0200,134F   ;3162           VA_ALU,ALU_D+K[.20]             ; LOAD ADR OF EXPECTED DATA
U 134F, 0000,003C,0180,C800,0000,1350   ;3163           D[LONG]_CACHE.P                 ; GET EXPECTED DATA
U 1350, 0001,003C,0180,09F0,0000,10F4   ;3164           RC[0E]_D                        ; SAVE
U 10F4, 0000,003D,0180,0800,0000,11A2   ;3165   =0      ERLOOP
U 10F5, 0000,003C,0180,0800,0000,10F6   ;3166   T12DL2: NOP
U 10F6, 2000,003D,0180,0A00,4200,11D7   ;3167   =0      ALU_R[0],FLUSH.IB,CALL[IBWAIT]  ; LOAD THE IB WITH DATA
U 10F7, 0000,003C,0180,0800,0000,10F8   ;3168           NOP
U 10F8, 0000,003D,0180,0800,0000,11D2   ;3169   =0      CALL[SETCM]                     ; SET THE CM BIT
U 10F9, 0000,003C,0180,0800,0000,10FA   ;3170           NOP
U 10FA, 0000,003D,0180,0800,0000,11D1   ;3171   =0      CALL[DISPAT]                    ; GO TO EXECUTION POINT 1
U 10FB, 0810,0038,0180,0970,0000,10FC   ;3172           D_RC[0E]                        ; GET EXPECTED DMUX DATA
U 10FC, 0000,003D,0180,0800,0000,11D1   ;3173   =0      CALL[DISPAT]                    ; GO TO EXECUTION POINT 2
U 10FD, 0000,003C,0180,0800,0000,10FE   ;3174           NOP
U 10FE, 0000,003D,0180,0800,0000,11D1   ;3175   =0      CALL[DISPAT]                    ; GO TO EXECUTION POINT 3
U 10FF, 0000,003C,0180,0800,0000,110A   ;3176           NOP
U 110A, 0000,003D,0180,0800,0000,11D1   ;3177   =0      CALL[DISPAT]                    ; GO TO EXECUTION POINT 4
U 110B, 0000,003C,01F0,2C00,0000,1351   ;3178           Q_ID[IBUF]                      ; READ THE DMUX
U 1351, 001D,2000,0180,0800,0010,1352   ;3179           ALU_Q-D,CLK.UBCC                ; CHECK IF CORRECT
U 1352, 0000,013C,0180,0800,0000,1110   ;3180           Z?
U 1110, 0001,203D,0180,09E8,0000,11A5   ;3181   =0      ERROR2,RC[0D]_Q                 ; DMUX SELECTED WRONG
U 1111, 0000,003C,0180,0A00,0000,1353   ;3182           LAB_R[0]                        ; LATCH ADR OF IB DATA
U 1353, 0018,0014,0180,0A80,0000,1354   ;3183           R[0]_LA+K[.8]                   ; INCREMENT FOR NEXT TIME THRU LOOP
U 1354, 0810,0038,0180,0960,0000,1355   ;3184           D_RC[0C]                        ; GET THE LOOP COUNT
U 1355, 0019,8000,0580,09E0,0010,1356   ;3185           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DONE YET?
U 1356, 0000,013C,0180,0800,0000,1112   ;3186           Z?
U 1112, 0000,003C,0180,0800,0000,10F5   ;3187   =0      J/T12DL2                        ; NO, CHECK NEXT PATTERN
U 1113, 0000,003C,0180,0800,0000,1114   ;3188           NOP
                                        ;3189   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;3190   ;% 2C0
                                        ;3191   ; LOOP COUNT EQUALS F THRU 1, EACH PASS THRU LOOP READS TWO LONG WORDS
                                        ;3192   ;$ 1030,5555,FFFF,0000
                                        ;3193   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                        ;3194   ; 010060,052525,177777,000000
                                        ;3195   ;
                                        ;3196   ;$ 7817,AAAA,0000,0000
                                        ;3197   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
```

```
; 074027,125252,000000,000000
;$ 0A17,5555,FFFF,0000
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 005027,052525,177777,000000

; TWINKLE ECO IN FEBRUARY 1981
;*********************************************
;$ 0C17,5555,FFFF,0000
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 006027,052525,177777,000000
;$ 0D97,5555,FFFF,0000
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 006627,052525,177777,000000
;$ 0E17,5555,FFFF,0000
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 007027,052525,177777,000000
;*********************************************

;$ 1C28,AAAA,0000,0000
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 016050,125252,000000,000000
;$ 15E8,5555,FFFF,0000
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 012750,052525,177777,000000
;$ 01AD,0000,0000,0000
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 000655,000000,000000,000000
;$ 11D6,0000,0000,0000
; EQUIVALENT OCTAL DATA = 10726,000000
;$ 1015,0000,0000,0000
; OCTAL DATA = 10025,000000
;$ 1013,0000,0000,0000
; OCTAL DATA = 10023,000000
;$ 1007,0000,0000,0000
; OCTAL DATA = 10007,000000
;$ 1430,0000,0000,0000
; OCTAL DATA = 12060,000000
;$ 0D30,0000,0000,0000
; OCTAL DATA = 6460,000000
;
; SUBTEST 2
;$ 1A30,5555,FFFF,0000
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 015060,052525,177777,000000
;
;
; THE FOLLOWING IS THE EXPECTED D MUX DATA FOR THE ABOVE TEST:
;% 340
; LOOP COUNT EQUALS C THRU 1, EACH PASS THRU LOOP USES ONE LONG WORD
;$ 5555,0000
;$ AAAA,FFFF
;$ 5555,0000

;$ 5555,0000
;$ FF2E,FFFF
```

```
;3253   ;$ 002E,0000
;3254
;3255   ;$ AAAA,FFFF
;3256   ;$ 5555,0000
;3257   ;$ FF5A,FFFF
;3258   ;$ FFAC,FFFF
;3259   ;$ 002A,0000
;3260   ;$ 0026,0000
;3261   ;$ 000E,0000
;3262   ;$ 0060,0000
;3263   ;$ 0060,0000
;3264   ;
;3265   ; SUBTEST 2
;3266   ;$ 5555,0000
;3267
;3268
;3269
```

```
                                        .PAGE   "TEST 12E       IBA BIT<1:0> CONTROL"
                                        ;************************************************************************
                                        ;++
                                        ; TEST  12E     IBA BIT<1:0> CONTROL
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST CHECKS THAT THE BYTE ROTATOR IS SELECTED CORRECTLY
                                        ;       AFTER SOME BYTES HAVE BEEN SHIFTED OUT OF THE BUFFER. THIS IS DONE
                                        ;       BY FILLING THE BUFFER WITH THE SPECIFIED VALUE OF IBA BITS <1:0>,
                                        ;       EXECUTING THE SPECIFIED SHIFT, ALLOWING ONE MORE LONG WORD
                                        ;       TO BE READ INTO THE BUFFER, THROWING AWAY BYTES 0 THRU 6, AND CHECKING
                                        ;       THAT THE BYTE ROTATOR PLACED THE CORRECT DATA IN BYTE 7.
                                        ;       THE DATA PATTERN CONSISTS OF 8 BYTES OF ZERO FOLLOWED BY THE FOLLOWING
                                        ;       BYTES:   01, 02, 03, 04, 05, 06, AND 07. THE CORRECT DATA IN
                                        ;       BYTE 7 IS TESTED BY CHECKING THE MICRO PC BITS <7:0> WHICH SHOULD
                                        ;       REFLECT THE A FORK ADDRESS OF ONE OF THE ABOVE 7 BYTES.
                                        ;
                                        ;       SUBTST 1 - CHECK THAT A SHIFT OF ONE INCREMENTS THE CURRENT VALUE
                                        ;                  OF IBA BITS<1:0> BY ONE.
                                        ;       SUBTST 2 - CHECK THAT A SHIFT OF TWO INCREMENTS THE CURRENT VALUE
                                        ;                  OF IBA BITS <1:0> BY TWO.
                                        ;       SUBTST 3 - CHECK THAT A SHIFT OF FOUR INCREMENTS THE CURRENT VALUE
                                        ;                  OF IBA BITS <1:0> BY FOUR, (IBA BITS <1:0> SHOULD REMAIN
                                        ;                  THE SAME).
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS THE LOGIC THAT GENERATES THE "IBA0" AND "IBA1"
                                        ;       SIGNALS ON THE IDP MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                        ;             RECEIVED MICRO PC BITS <7:0>
                                        ;             LOOP COUNT -- INDICATES THE INITIAL VALUE OF IBA BITS <1:0>,
                                        ;               I.E. 4=00, 3=01, 2=10, AND 1=11.
                                        ;       FROM THE RECEIVED MICRO PC BITS, ONE CAN TELL HOW THE BYTE ROTATOR
                                        ;       FAILED. FOR EXAMPLE, IF THE EXPECTED DATA WAS 8E AND THE RECEIVED
                                        ;       DATA WAS 8D, IT WOULD MEAN THAT THE BYTE ROTATOR ROTATED THE DATA
                                        ;       ONE TOO MANY BYTES. IN OTHER WORDS BYTE 7 WAS LOADED WITH 02 INSTEAD
                                        ;       OF 01.
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       SUBTST 1 - SYNC03--IBA BITS <1:0> ARE INCREMENTED
                                        ;       SUBTST 2 - SYNC04--IBA BITS <1:0> ARE INCREMENTED
                                        ;       SUBTST 3 - SYNC05--IBA BITS <1:0> ARE INCREMENTED
                                        ;--
                                        ;************************************************************************
                                        =0
U 1114, 0000,003D,0180,0800,0000,118E   T12E:   NEWTST
U 1115, 0018,0038,0D80,09F8,0000,1357           RC[OF]_K[.3]
U 1357, 0818,0038,7980,0800,0000,1116           D_K[.30]                        ; GENERATE ADR OF IB DATA
U 1116, 0819,0031,F580,0800,0000,11A7   =0      D_D.OR.K[.A],CALL,J/DC0         ; EQUALS 3A0(X)
U 1117, 0001,003C,0180,0A88,0000,1118           R[1]_D                          ; SAVE
U 1118, 0818,0039,0180,0800,0000,11B5   =0      D_K[.8],CALL,J/DCE              ; GENERATE ADR OF A FORK DECODE
                                                                                ; OF OPCODE 01
U 1119, 0001,003C,0180,09F0,0000,1358           RC[OE]_D
```

```
U 1358, 0001,003C,0180,0A80,0000,111A   ;3325                   R[0]_D                          ; SAVE
                                        ;3326
                                        ;3327           ;//////////////////////////////////////////////////////////////////////
                                        ;3328           ;+
                                        ;3329           ; CHECK A SHIFT OF ONE BYTE
                                        ;3330           ;-
                                        ;3331
                                        ;3332           =0
U 111A, 0000,003D,0180,0800,0000,11BC   ;3333           T12ES1: SUBTEST
U 111B, 0018,0038,1180,09E0,0000,111C   ;3334                   RC[0C]_K[.4]                    ; SET THE LOOP COUNT
U 111C, 0000,003D,0180,0800,0000,11A2   ;3335           =0      ERLOOP
U 111D, 0000,003C,0180,0800,0000,111E   ;3336           T12EL1: NOP
U 111E, 2000,003D,0180,0A08,4200,11D7   ;3337           =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 111F, C000,003C,0180,0800,0000,1120   ;3338           SYNC03: IBC7CLR.0                       ; EXECUTE THE SHIFT
U 1120, 0000,003D,0180,0800,0000,11DF   ;3339           =0      CALL,J/GETBYTE7                 ; READ ANOTHER WORD AND SHIFT OVER
                                        ;3340                                                   ; TO BYTE 7
U 1121, 0810,0038,0180,0970,0000,1122   ;3341                   D_RC[0E]
U 1122, 0000,003D,0180,0800,0000,11D1   ;3342           =0      CALL,J/DISPAT                   ; EXECUTE BYTE 0
U 1123, 001D,A000,0180,0800,0010,1359   ;3343                   ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 1359, 0000,013C,0180,0800,0000,1124   ;3344                   Z?
U 1124, 0001,A03D,0180,09E8,0000,11A5   ;3345           =0      ERROR2,RC[0D]_Q,BYTE            ; IBA BITS <1:0> FAILED
                                        ;3346
                                        ;3347           ;+
                                        ;3348           ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3349           ;-
                                        ;3350
U 1125, 0000,003C,0180,0A08,0000,135A   ;3351                   LAB_R[1]
U 135A, 0018,0014,0580,0A88,0000,135B   ;3352                   R[1]_LA+K[.1]                   ; INCREMENT INITIAL VALUE OF IBA
U 135B, 0810,0038,0180,0970,0000,135C   ;3353                   D_RC[0E]
U 135C, 0019,0000,0580,09F0,0000,135D   ;3354                   RC[0E]_D-K[.1]                  ; SELECT NEXT EXPECTED ADDRESS
U 135D, 0810,0038,0180,0960,0000,135E   ;3355                   D_RC[0C]
U 135E, 0019,8000,0580,09E0,0010,135F   ;3356                   RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT THE LOOP COUNT
U 135F, 0000,013C,0180,0800,0000,1126   ;3357                   Z?
U 1126, 0000,003C,0180,0800,0000,111D   ;3358           =0      J/T12EL1                        ; CONTINUE
                                        ;3359
                                        ;3360           ;//////////////////////////////////////////////////////////////////////
                                        ;3361           ;+
                                        ;3362           ; CHECK A SHIFT OF TWO BYTES
                                        ;3363           ;-
                                        ;3364
U 1127, 0800,003C,0180,0A00,0000,1360   ;3365           T12ES2: D_R[0]                          ; GET ADDRESS OF OPCODE 01
U 1360, 0019,0000,0580,09F0,0000,1128   ;3366                   RC[0E]_D-K[.1]                  ; SET INIT ADR TO THAT OF OPCODE 02
U 1128, 0000,003D,0180,0800,0000,11BC   ;3367           =0      SUBTEST
U 1129, 0018,0038,1180,09E0,0000,1361   ;3368                   RC[0C]_K[.4]                    ; SET THE LOOP COUNT
U 1361, 0818,0038,7980,0800,0000,112A   ;3369                   D_K[.30]                        ; SET ADDRESS OF IB DATA
U 112A, 0819,0031,F580,0800,0000,11A7   ;3370           =0      D_D.OR.K[.A],CALL,J/DCO         ; EQUALS 370(16)
U 112B, 0001,003C,0180,0A88,0000,112C   ;3371                   R[1]_D
U 112C, 0000,003D,0180,0800,0000,11A2   ;3372           =0      ERLOOP
U 112D, 0000,003C,0180,0800,0000,112E   ;3373           T12EL2: NOP
U 112E, 2000,003D,0180,0A08,4200,11D7   ;3374           =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 112F, 4000,003C,0180,0800,0000,1130   ;3375           SYNC04: IBC7CLR.0.1                     ; EXECUTE THE SHIFT
U 1130, 0000,003D,0180,0800,0000,11DF   ;3376           =0      CALL,J/GETBYTE7                 ; READ ANOTHER WORD AND GET BYTE 7
U 1131, 0810,0038,0180,0970,0000,1132   ;3377                   D_RC[0E]
U 1132, 0000,003D,0180,0800,0000,11D1   ;3378           =0      CALL,J/DISPAT                   ; EXECUTE BYTE 7
U 1133, 001D,A000,0180,0800,0010,1362   ;3379                   ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
```

```
U 1362, 0000,013C,0180,0800,0000,1134   ;3380           Z?
U 1134, 0001,A03D,0180,09E8,0000,11A5   ;3381   =0      ERROR2,RC[0D]_Q,BYTE            ; IBA BITS <1:0> FAILED
                                        ;3382
                                        ;3383   ;+
                                        ;3384   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3385   ;-
                                        ;3386
U 1135, 0000,003C,0180,0A08,0000,1363   ;3387           LAB_R[1]
U 1363, 0018,0014,0580,0A88,0000,1364   ;3388           R[1]_LA+K[.1]                   ; INCREMENT INIT VALUE OF IBA
U 1364, 0810,0038,0180,0970,0000,1365   ;3389           D_RC[0E]
U 1365, 0019,0000,0580,09F0,0000,1366   ;3390           RC[0E]_D-K[.1]                  ; SET NEXT VALUE OF EXP ADDRESS
U 1366, 0810,0038,0180,0960,0000,1367   ;3391           D_RC[0C]
U 1367, 0019,8000,0580,09E0,0010,1368   ;3392           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 1368, 0000,013C,0180,0800,0000,1136   ;3393           Z?
U 1136, 0000,003C,0180,0800,0000,112D   ;3394   =0      J/T12EL2                        ; CONTINUE
                                        ;3395
                                        ;3396   ;//////////////////////////////////////////////////////////////////////
                                        ;3397   ;+
                                        ;3398   ; CHECK A SHIFT OF FOUR
                                        ;3399   ;-
                                        ;3400
U 1137, 0800,003C,0180,0A00,0000,1369   ;3401   T12ES3: D_R[0]                          ; GET ADDRESS OF OPCODE 01
U 1369, 0019,0000,0D80,09F0,0000,136A   ;3402           RC[0E]_D-K[.3]                  ; GENERATE ADR OF OPCODE 04
U 136A, 0818,0038,7980,0800,0000,1138   ;3403           D_K[.30]                        ; SET ADR OF IB DATA
U 1138, 0819,0031,F580,0800,0000,11A7   ;3404   =0      D_D.OR.K[.A],CALL,J/DC0         ; ...
U 1139, 0001,003C,0180,0A88,0000,113A   ;3405           R[1]_D
U 113A, 0000,003D,0180,0800,0000,11BC   ;3406   =0      SUBTEST
U 113B, 0018,0038,1180,09E0,0000,113C   ;3407           RC[0C]_K[.4]                    ; SET THE LOOP COUNT
U 113C, 0000,003D,0180,0800,0000,11A2   ;3408   =0      ERLOOP
U 113D, 0000,003C,0180,0800,0000,113E   ;3409   T12EL3: NOP
U 113E, 2000,003D,0180,0A08,4200,11D7   ;3410   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 113F, E000,003C,0180,0800,0000,1140   ;3411   SYNC05: IBC7CLR.0-3                     ; EXECUTE THE SHIFT
U 1140, 0000,003D,0180,0800,0000,11DF   ;3412   =0      CALL,J/GETBYTE7                 ; READ ANOTHER WORD AND GET BYTE 7
U 1141, 0810,0038,0180,0970,0000,1142   ;3413           D_RC[0E]
U 1142, 0000,003D,0180,0800,0000,11D1   ;3414   =0      CALL,J/DISPAT                   ; EXECUTE BYTE 7
U 1143, 001D,A000,0180,0800,0010,136B   ;3415           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 136B, 0000,013C,0180,0800,0000,1144   ;3416           Z?
U 1144, 0001,A03D,0180,09E8,0000,11A5   ;3417   =0      ERROR2,RC[0D]_Q,BYTE            ; IBA BITS <1:0> FAILED
                                        ;3418
                                        ;3419   ;+
                                        ;3420   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3421   ;-
                                        ;3422
U 1145, 0000,003C,0180,0A08,0000,136C   ;3423           LAB_R[1]
U 136C, 0018,0014,0580,0A88,0000,136D   ;3424           R[1]_LA+K[.1]                   ; INCREMENT INIT VALUE OF IBA
U 136D, 0810,0038,0180,0970,0000,136E   ;3425           D_RC[0E]
U 136E, 0019,0000,0580,09F0,0000,136F   ;3426           RC[0E]_D-K[.1]                  ; SET NEXT EXPECTED ADDRESS
U 136F, 0810,0038,0180,0960,0000,1370   ;3427           D_RC[0C]
U 1370, 0019,8000,0580,09E0,0010,1371   ;3428           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 1371, 0000,013C,0180,0800,0000,1146   ;3429           Z?
U 1146, 0000,003C,0180,0800,0000,113D   ;3430   =0      J/T12EL3                        ; CONTINUE
U 1147, 0000,003C,0180,0800,0000,1148   ;3431           NOP
                                        ;3432
                                        ;3433
                                        ;3434   ; FOLLOWING IS THE IB DATA USED IN THE ABOVE TEST:
```

```
;% 3A0
;$ 0000,0000,0000,0000,0201,0403,0605,0807



; THE FOLLOWING IS THE IB DATA FOR THE FIRST PART DONE TEST:
;% 3C0
; SUBTST 1 AND 2
;$ 6020,0060
;
; SUBTST 3 AND 4
;$ 4407,0000
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 042007,000000
;
; THE FOLLOWING DATA IS THE IB DATA FOR TEST 12D, SUBTEST 3.
; LOOP COUNT = 4
;% 410
;$ 8A17,AAAA,0000,0000
; OCTAL EQUIVALENT OF ABOVE OPCODE
; 105027,125252,000000,000000
;
; LOOP COUNT = 3
;$ 0057,AAAA,0000,0000
; OCTAL EQUIVALENT OF ABOVE OPCODE
; 000127,125252,000000,000000
;
; LOOP COUNT = 2
;$ 0917,AAAA,0000,0000
; OCTAL EQUIVALENT OF ABOVE OPCODE
; 004427,125252,000000,000000
;
; LOOP COUNT = 1
;$ 00D7,AAAA,0000,0000
; OCTAL EQUIVALENT OF ABOVE OPCODE
; 000327,125252,000000,000000
;
;
; THE FOLLOWING IS THE EXPECTED D MUX DATA FOR TEST 12D, SUBTEST 3
;
;% 430
; LOOP COUNT = 4,3,2, AND 1
;$ AAAA,FFFF
```

```
                                         .PAGE   "TEST 12F        M8224 IRD ROM BRANCH TEST"
                                         ;**************************************************************************
                                         ;++
                                         ;        TEST    12F     M8224 IRD ROM BRANCH TEST
                                         ;
                                         ; TEST DESCRIPTION
                                         ;        THIS TEST RUNS A COUNT PATTERN THRU BYTE 0 OF THE INSTRUCTION BUFFER
                                         ;        AND CHECKS ALL VALUES OF THE IRD AND REI BRANCH. THIS IS DONE BY
                                         ;        WRITING THE COUNT PATTERN TO CACHE LOCATION 0 (WITH A 'VALIDATE'
                                         ;        COMMAND), THEN ALLOWING THE IB TO FETCH LOCATION 500.
                                         ;           THE EXPECTED BRANCH CONDITION IS STORED IN BYTES STARTING AT
                                         ;        CACHE LOCATION 508. THE LOW NIBBLE IS THE EXPECTED 'IRD' BRANCH AND
                                         ;        THE UPPER NIBBLE IS THE EXPECTED 'REI' BRANCH (BIT 0).
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;        DATA: EXPECTED BRANCH
                                         ;              RECEIVED BRANCH
                                         ;              LOOP COUNT - THE LOOP COUNT MINUS ONE IS THE INSTRUCTION
                                         ;                           OP-CODE UNDER TEST.
                                         ;--
                                         ;**************************************************************************
                                         =0
U 1148, 0000,003D,0180,0800,0000,118E    T12F:   NEWTST
U 1149, 0000,003C,0180,0800,0000,1010            NOP
U 1010, 0000,003D,0180,0800,0000,11C9    =00     CALL[CHECK_TWINKLE]            ; IS THIS A TWINKLE MACHINE?
U 1011, 0000,003C,0180,0800,0000,1372            J/T12F_EXEC                    ; BRANCH IF YES
U 1012, 0000,003C,0180,0800,0000,138D            J/T12F_EXIT                    ; NO
                                         =
                                         T12F_EXEC:
U 1372, 0018,0038,0D80,09F8,0000,114A            RC[0F]_K[.3]
U 114A, 0818,0039,3580,0800,0000,11A7    =0      D_K[.50],CALL[DC0]             ; 500(X)
U 114B, 0001,003C,0180,0A88,0000,1373            R[1]_D                         ; SAVE ADDRESS OF IB DATA
U 1373, 0019,0030,0180,0A90,0000,114C            R[2]_D.OR.K[.8]                ; GET ADDRESS OF EXPECTED DATA=508(X)
U 114C, 0818,0039,6580,0800,0000,11A7    =0      D_K[.10],CALL[DC0]             ; GENERATE LOOP COUNT
U 114D, 0001,003C,0180,09E0,0084,7374            RC[0C]_D,SC_K[.8]              ; ...
U 1374, 0818,0038,35F8,0800,0000,1375            D_K[.50],Q_0                   ; GET DATA TO FORCE REPLACE GROUP
U 1375, 0819,0030,4180,0800,0000,1376            D_D.OR.K[.80]                  ; ...
U 1376, 0D00,003C,0180,0800,0000,1377            D_DAL.SC                       ; ZERO AND DISABLE SBI IN THE CACHE
U 1377, 0000,003C,7580,3C00,0000,1378            ID[MAINT]_D                    ; AND FORCE MISS GROUP 1

                                         T12F_L1:
U 1378, 0000,003C,0180,0A10,0200,1379            VA_R[2]                        ; LOAD ADDRESS OF EXPECTED DATA
U 1379, 0000,803C,0180,C800,0000,137A            D[BYTE]_CACHE.P                ; GET EXPECTED DATA
U 137A, 0001,003C,0180,0980,0000,137B            RC[0]_D                        ; SAVE
U 137B, 0000,003C,0180,0A08,0200,137C            VA_R[1]                        ; LOAD ADDRESS OF IB DATA
U 137C, 0810,0038,0180,0960,0000,137D            D_RC[0C]                       ; GET DATA
U 137D, 0819,0000,0580,0800,0000,137E            D_D-K[.1]                      ; ...
U 137E, 0000,003C,0180,9800,0000,137F            MCT/VALIDATE
U 137F, 0000,003C,0180,0803,0000,1380            VA_VA+4
U 1380, 0000,003C,0180,9800,0000,114E            MCT/VALIDATE
U 114E, 0000,003D,0180,0800,0000,11A2    =0      ERLOOP
U 114F, 0810,0038,0180,0900,0000,1381            D_RC[0]                        ; GET EXPECTED RESULT
U 1381, 0019,0034,5D80,09F0,0000,1150            RC[0E]_D.AND.K[.7]             ; SAVE FOR TYPEOUT
U 1150, 2000,003D,0180,0A08,4200,11D7    =0      ALU_R[1],FLUSH.IB,CALL[IBWAIT] ; LOAD THE IB
U 1151, 0810,0038,0180,0970,0000,1152            D_RC[0E]
```

```
U 1152, 0018,0039,01C0,0800,0000,138C   ;3536   =0      Q_K[.8],CALL[BR13]                ; SEE WHICH BRANCH IS ACTIVE
U 1153, 001D,2000,0180,0800,0010,1382   ;3537           ALU_Q-D,CLK.UBCC                  ; EXPECTED BRANCH?
U 1382, 0001,213C,0180,09E8,0000,1156   ;3538           Z?,RC[0D]_Q
U 1156, 0000,003D,0180,0800,0000,11A5   ;3539   =0      ERROR2                            ; INCORRECT BRANCH
                                        ;3540   ;
                                        ;3541   ; NOW CHECK BIT 0 OF THE ROM WITH THE REI BRANCH
                                        ;3542   ;
U 1157, 0810,0038,0180,0900,0000,1383   ;3543           D_RC[0]                           ; GET EXPECTED RESULT
U 1383, 0200,003C,0180,0800,0000,1384   ;3544           D_D.RIGHT2
U 1384, 0200,003C,0180,0800,0000,1385   ;3545           D_D.RIGHT2
U 1385, 0819,0034,0580,09F0,0000,1158   ;3546           RC[0E]_ALU,D_D.AND.K[.1]          ; SAVE FOR TYPEOUT
U 1158, 0000,003D,0180,0800,0000,138B   ;3547   =0      CALL[BR0A]                        ; EXECUTE THE BRANCH
U 1159, 001D,2000,0180,0800,0010,1386   ;3548           ALU_Q-D,CLK.UBCC
U 1386, 0001,213C,0180,09E8,0000,115A   ;3549           Z?,RC[0D]_Q
U 115A, 0000,003D,0180,0800,0000,11A5   ;3550   =0      ERROR2
U 115B, 0800,003C,0180,0A10,0000,1387   ;3551           D_R[2]                            ; GET EXPECTED DATA ADDRESS
U 1387, 0019,0014,0580,0A90,0000,1388   ;3552           R[2]_ALU,ALU_D+K[.1]              ; INCREMENT IT
U 1388, 0810,0038,0180,0960,0000,1389   ;3553           D_RC[0C]                          ; GET THE LOOP COUNT
U 1389, 0819,0000,0580,09E0,0010,138A   ;3554           D_D-K[.1],RC[0C]_ALU,CLK.UBCC     ; DECREMENT
U 138A, 0000,013C,0180,0800,0000,115C   ;3555           Z?                                ; DONE YET?
U 115C, 0000,003C,0180,0800,0000,1378   ;3556   =0      J/T12F_L1                         ; BRANCH IF NO
U 115D, 0000,003C,0180,0800,0000,138D   ;3557           J/T12F_EXIT
                                        ;3558
U 138B, 0000,0A3C,0180,0800,0000,115E   ;3559   BR0A:   BEN/REI
U 115E, 0018,003A,05C0,0800,0000,0001   ;3560   =0      Q_K[.1],RETURN1
U 115F, 0000,003E,01F8,0800,0000,0001   ;3561           Q_0,RETURN1
                                        ;3562
U 138C, 0000,043C,0180,0800,0000,1018   ;3563   BR13:   BEN/IRD
U 1018, 0019,2000,05C0,0800,0000,1019   ;3564   =1000   Q_Q-K[.1]
U 1019, 0019,2000,05C0,0800,0000,101A   ;3565           Q_Q-K[.1]
U 101A, 0019,2000,05C0,0800,0000,101B   ;3566           Q_Q-K[.1]
U 101B, 0019,2000,05C0,0800,0000,101C   ;3567           Q_Q-K[.1]
U 101C, 0019,2000,05C0,0800,0000,101D   ;3568           Q_Q-K[.1]
U 101D, 0019,2000,05C0,0800,0000,101E   ;3569           Q_Q-K[.1]
U 101E, 0019,2000,05C0,0800,0000,101F   ;3570           Q_Q-K[.1]
U 101F, 0019,2002,05C0,0800,0000,0001   ;3571           Q_Q-K[.1],RETURN1
                                        ;3572
                                        ;3573   T12F_EXIT:
U 138D, 0000,003C,0180,0800,0000,1160   ;3574           NOP
                                        ;3575
                                        ;3576   ;% 508
                                        ;3577   ; LOOP COUNT 100 THRU F1
                                        ;3578   ;$ 0000,0010,0000,0000,0707,0000,0000,0000
                                        ;3579   ; LOOP COUNT F0 - E1
                                        ;3580   ;$ 0000,0000,0000,0000,0000,0000,0000,0000
                                        ;3581   ; LOOP COUNT E0 - D1
                                        ;3582   ;$ 0000,0000,0000,0000,0000,0000,0000,0000
                                        ;3583   ; LOOP COUNT D0 - C1
                                        ;3584   ;$ 0000,0000,0000,0000,0000,0000,0000,0000
                                        ;3585   ; LOOP COUNT C0 - B1
                                        ;3586   ;$ 0000,0000,0000,0000,0000,0000,0000,0000
                                        ;3587   ; LOOP COUNT B0 - A1
                                        ;3588   ;$ 0000,0000,0000,0000,0000,0000,0000,0000
                                        ;3589   ; LOOP COUNT A0 - 91
                                        ;3590   ;$ 0000,0000,0000,0606,0000,0000,0000,0000
```

```
;3591    ; LOOP COUNT 90 - 81
;3592    ;$ 0000,0000,0000,0000,0000,0000,0000,0000
;3593    ; LOOP COUNT 80 - 71
;3594    ;$ 0101,0104,0000,0000,0100,0303,0101,0101
;3595    ; LOOP COUNT 70 - 61
;3596    ;$ 0201,0202,0101,0101,0101,0101,0101,0101
;3597    ; LOOP COUNT 60 - 51
;3598    ;$ 0000,0000,0000,0000,0100,0303,0101,0101
;3599    ; LOOP COUNT 50 - 41
;3600    ;$ 0201,0202,0101,0101,0101,0101,0101,0101
;3601    ; LOOP COUNT 40 - 31
;3602    ;$ 0000,0000,0000,0000,0000,0000,0607,0000
;3603    ; LOOP COUNT 30 - 21
;3604    ;$ 0000,0000,0000,0000,0000,0000,0000,0000
;3605    ; LOOP COUNT 20 - 11
;3606    ;$ 0000,0000,0000,0000,0000,0000,0000,0000
;3607    ; LOOP COUNT 10 - 1
;3608    ;$ 0000,0000,0000,0000,0000,0000,0000,0000
;3609
```

```
                                      .PAGE   "TEST 130      M8224 IRD EXECUTION POINT COUNTER TEST"
                                      ;***********************************************************************
                                      ;++
                                      ;
                                      ; TEST 130      M8224 IRD EXECUTION POINT COUNTER TEST
                                      ;
                                      ; FUNCTIONAL DESCRIPTION:
                                      ;
                                      ;       THIS TEST CHECKS THAT THE EXECUTION POINT COUNTER ADVANCES CORRECTLY
                                      ;       WHEN AN ESCAPE OP CODE IS BEING DECODED.
                                      ;
                                      ; ERROR DESCRIPTION:
                                      ;       DATA: EXPECTED MICRO PC
                                      ;             RECEIVED MICRO PC
                                      ;
                                      ;--
                                      ;***********************************************************************
                                      =0
U 1160, 0000,003D,0180,0800,0000,118E T130:   NEWTST
U 1161, 0000,003C,0180,0800,0000,1014         NOP
U 1014, 0000,003D,0180,0800,0000,11C9 =00     CALL[CHECK_TWINKLE]          ; IS THIS A TWINKLE MACHINE?
U 1015, 0000,003C,0180,0800,0000,138E         J/T130_EXEC                  ; YES
U 1016, 0000,003C,0180,0800,0000,118D         J/T130_EXIT                  ; NO
                                      =
                                      T130_EXEC:
U 138E, 0018,0038,0980,09F8,0000,1162         RC[0F]_K[.2]
U 1162, 0818,0039,1180,0800,0000,11B2 =0      D_K[.4],CALL[DCB]            ; GENERATE CONSTANT 4B
U 1163, 0001,003C,0180,09F0,0000,138F         RC[0E]_D                     ; EXPECTED DATA
U 138F, 0818,0038,A580,0800,0000,1164         D_K[.60]                     ; GENERATE ADDRESS OF IB DATA
U 1164, 0819,0031,1180,0800,0000,11A7 =0      D_D.OR.K[.4],CALL[DC0]       ; = 640(X)
U 1165, 0001,003C,0180,0A88,0000,1166         R[1]_D
                                      ;
                                      ; CHECK THAT THE EXECUTION POINT COUNTER ADVANCES TO EP1
                                      ; BDEST * ESC(0) * BC4-1 * BC4-2
                                      ;
                                      ;//////////////////////////////////////////////////////////////////////
U 1166, 0000,003D,0180,0800,0000,11BC =0      SUBTEST
U 1167, 0000,003C,0180,0800,0000,1168         NOP
U 1168, 0000,003D,0180,0800,0000,11A2 =0      ERLOOP
U 1169, 0000,003C,0180,0800,0000,116A         NOP
U 116A, 2000,003D,0180,0A08,4200,11D7 =0      ALU_R[1],FLUSH.IB,CALL[IBWAIT] ; LOAD THE IB
U 116B, C000,003C,0180,0800,0000,1390         IBC7CLR.0                    ; LOAD THE ESC FLIP-FLOP
U 1390, 7000,003C,0180,0800,0000,116C         IBC/BDEST                    ; SHOULD ADVANCE EP COUNTER
U 116C, 0000,003D,01F8,0800,0000,11D1 =0      Q_0,CALL[DISPAT]             ; EXECUTE THE CALL 3
U 116D, 0810,0038,0180,0970,0000,1391         D_RC[0E]                     ; GET EXPECTED MICRO PC
U 1391, 001D,2000,0180,0800,0010,1392         ALU_Q-D,CLK.UBCC             ; WAS EP COUNTER AT 1?
U 1392, 0001,213C,0180,09E8,0000,116E         Z?,RC[0D]_Q                  ; BRANCH IF YES
U 116E, 0000,003D,0180,0800,0000,11A5 =0      ERROR2
U 116F, 0000,003C,0180,0800,0000,1170         NOP
                                      ;
                                      ; NOW CHECK THAT THE EP DOSEN'T INCREMENT WHEN ESC IS NOT ASCERTED
                                      ; BDEST * -ESC(0) * BC4-1 * BC4-2
                                      ;
                                      ;//////////////////////////////////////////////////////////////////////
U 1170, 0000,003D,0180,0800,0000,11BC =0      SUBTEST
```

```
U 1171, 0800,003C,0180,0A08,0000,1393   ;3665          D_R[1]                          ; GET ADDRESS OF IB DATA
U 1393, 0019,0014,0180,0A88,0000,1394   ;3666          R[1]_D+K[.8]                    ; INCREMENT
U 1394, 0818,0038,1180,0800,0000,1395   ;3667          D_K[.4]
U 1395, 0001,003C,0180,09F0,0000,1172   ;3668          RC[0E]_D                        ; SET EXPECTED DATA
U 1172, 0000,003D,0180,0800,0000,11A2   ;3669   =0     ERLOOP
U 1173, 0000,003C,0180,0800,0000,1174   ;3670          NOP
U 1174, 2000,003D,0180,0A08,4200,11D7   ;3671   =0     ALU_R[1],FLUSH.IB,CALL[IBWAIT]  ; LOAD THE IB
U 1175, C000,003C,0180,0800,0000,1396   ;3672          IBC7CLR.0                       ; TRY AND CLOCK THE ESC LATCH
U 1396, 7000,003C,0180,0800,0000,1176   ;3673          IBC/BDEST                       ; TRY AND ADVANCE IB COUNTER
U 1176, 0000,003D,0180,0800,0000,11D1   ;3674   =0     CALL[DISPAT]                    ; CHECK THAT STILL AT EP0
U 1177, 0810,0038,0180,0970,0000,1397   ;3675          D_RC[0E]
U 1397, 001D,2000,0180,0800,0010,1398   ;3676          ALU_Q-D,CLK.UBCC                ; CHECK RECEIVED MICRO PC
U 1398, 0001,213C,0180,09E8,0000,1178   ;3677          Z?,RC[0D]_Q                     ; BRANCH IF OK
U 1178, 0000,003D,0180,0800,0000,11A5   ;3678   =0     ERROR2
U 1179, 0000,003C,0180,0800,0000,117A   ;3679          NOP
                                        ;3680
                                        ;3681   ;
                                        ;3682   ; CHECK THAT EP DOES NOT ADVANCE IF IRD ROM BIT BC4-2 IS NOT ACTIVE
                                        ;3683   ; BDEST * ESC(0) * BC4-1 * -BC4-2
                                        ;3684   ;
                                        ;3685   ;//////////////////////////////////////////////////////////////////////
U 117A, 0000,003D,0180,0800,0000,11BC   ;3686   =0     SUBTEST
U 117B, 0800,003C,0180,0A08,0000,1399   ;3687          D_R[1]                          ; GET ADDRESS OF IB DATA
U 1399, 0019,0014,0180,0A88,0000,139A   ;3688          R[1]_D+K[.8]                    ; INCREMENT
U 139A, 0818,0038,D580,0800,0000,139B   ;3689          D_K[.6]
U 139B, 0001,003C,0180,09F0,0000,117C   ;3690          RC[0E]_D                        ; SET EXPECTED DATA
U 117C, 0000,003D,0180,0800,0000,11A2   ;3691   =0     ERLOOP
U 117D, 0000,003C,0180,0800,0000,117E   ;3692          NOP
U 117E, 2000,003D,0180,0A08,4200,11D7   ;3693   =0     ALU_R[1],FLUSH.IB,CALL[IBWAIT]  ; LOAD THE IB
U 117F, C000,003C,0180,0800,0000,139C   ;3694          IBC7CLR.0                       ; SET THE ESC LATCH
U 139C, 7000,003C,0180,0800,0000,1180   ;3695          IBC/BDEST                       ; TRY AND ADVANCE IB COUNTER
U 1180, 0000,003D,0180,0800,0000,11D1   ;3696   =0     CALL[DISPAT]                    ; CHECK THAT STILL AT EP0
U 1181, 0810,0038,0180,0970,0000,139D   ;3697          D_RC[0E]
U 139D, 001D,2000,0180,0800,0010,139E   ;3698          ALU_Q-D,CLK.UBCC                ; CHECK RECEIVED MICRO PC
U 139E, 0001,213C,0180,09E8,0000,1182   ;3699          Z?,RC[0D]_Q                     ; BRANCH IF OK
U 1182, 0000,003D,0180,0800,0000,11A5   ;3700   =0     ERROR2
U 1183, 0000,003C,0180,0800,0000,1184   ;3701          NOP
                                        ;3702   ;
                                        ;3703   ; CHECK THAT EP COUNTER DOES NOT ADVANCE IF BDEST IS NOT ACTIVE
                                        ;3704   ; -BDEST * ESC(0) * BC4-1 * BC4-2
                                        ;3705   ;
                                        ;3706   ;//////////////////////////////////////////////////////////////////////
U 1184, 0000,003D,0180,0800,0000,11BC   ;3707   =0     SUBTEST
U 1185, 0800,003C,0180,0A08,0000,139F   ;3708          D_R[1]                          ; GET ADDRESS OF IB DATA
U 139F, 0019,0014,0180,0A88,0000,13A0   ;3709          R[1]_D+K[.8]                    ; INCREMENT
U 13A0, 0818,0038,1180,0800,0000,13A1   ;3710          D_K[.4]
U 13A1, 0001,003C,0180,09F0,0000,1186   ;3711          RC[0E]_D                        ; SET EXPECTED DATA
U 1186, 0000,003D,0180,0800,0000,11A2   ;3712   =0     ERLOOP
U 1187, 0000,003C,0180,0800,0000,1188   ;3713          NOP
U 1188, 2000,003D,0180,0A08,4200,11D7   ;3714   =0     ALU_R[1],FLUSH.IB,CALL[IBWAIT]  ; LOAD THE IB
U 1189, C000,003C,0180,0800,0000,13A2   ;3715          IBC7CLR.0                       ; LOAD THE ESC LATCH
U 13A2, 0000,003C,0180,0800,0000,118A   ;3716          NOP                             ; DON'T ASCERT BDEST
U 118A, 0000,003D,0180,0800,0000,11D1   ;3717   =0     CALL[DISPAT]                    ; CHECK THAT STILL AT EP0
U 118B, 0810,0038,0180,0970,0000,13A3   ;3718          D_RC[0E]
U 13A3, 001D,2000,0180,0800,0010,13A4   ;3719          ALU_Q-D,CLK.UBCC                ; CHECK RECEIVED MICRO PC
```

```
U 13A4, 0001,213C,0180,09E8,0000,118C   ;3720           Z?,RC[0D]_Q                     ; BRANCH IF OK
U 118C, 0000,003D,0180,0800,0000,11A5   ;3721   =0      ERROR2
                                        ;3722   T130_EXIT:
U 118D, 0000,003C,0180,0800,0000,13A5   ;3723           NOP
                                        ;3724
                                        ;3725   ;% 640
                                        ;3726   ; IB DATA FOR SUBTEST 1
                                        ;3727   ;$ 33FD,5050,5050,5050
                                        ;3728   ; IB DATA FOR SUBTEST 2
                                        ;3729   ;$ 3300,5050,5050,5050
                                        ;3730   ; IB DATA FOR SUBTEST 3
                                        ;3731   ;$ 75FD,5050,5050,5050
                                        ;3732   ; IB DATA FOR SUBTEST 4
                                        ;3733   ;$ 33FD,5050,5050,5050
                                        ;3734
                                        ;3735
                                        ;3736
U 13A5, 0000,003D,0180,0800,0000,118E   ;3737   ENDTST: NEWTST
```

```
;                        Location / Line Number Index

;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - OFFF Unused
U 1000           1876:    1845     1847=    1866=    1867=    1868=    1846     2066=
U 1008           3112=    3113=    3117=    1869     1884=    1885=    1870     2067=
U 1010           3505=    3506=    3507=    1871     3630=    3631=    3632=    1872
U 1018           3564=    3565=    3566=    3567=    3568=    3569=    3570=    3571=
U 1020           2060=    2061=    2443=    2444=    2446=    2447=    2448=    2449=
U 1028           2457=    2458=    2459=    2460=    2461=    2462=    2463=    2464=
U 1030           2465=    2466=    2468=    2475=    2476=    2477=    2478=    2479=
U 1038           2480=    2481=    2482=    2483=    2484=    2485=    2486=    2487=
U 1040           2488=    2489=    2491=    2498=    2499=    2500=    2501=    2502=
U 1048           2503=    2504=    2505=    2506=    2510=    2511=    1920:    1873
U 1050           2512=    2513=    2518=    2519=    2521=    2528=    2530=    2531=
U 1058           2532=    2533=    1924:    1874     2534=    2535=    1928:    1875
U 1060           2536=    2537=    2538=    2539=    2544=    2545=    2547=    2548=
U 1068           2580=    2581=    2583=    2584=    2585=    2586=    2597=    2598=
U 1070           2599=    2600=    2601=    2602=    2603=    2604=    2606=    2607=
U 1078           2614=    2615=    2693=    2694=    2696=    2697=    2698=    2699=
U 1080           2700=    2701=    2715=    2716=    2717=    2718=    2722=    2723=
U 1088           2724=    2725=    2727=    2728=    2737=    2738=    2791=    2792=
U 1090           2793=    2794=    2796=    2797=    2809=    2810=    2811=    2812=
U 1098           2813=    2814=    2815=    2816=    2817=    2818=    2820=    2821=
U 10A0           2828=    2829=    2908=    2909=    2911=    2912=    2922=    2923=
U 10A8           2924=    2925=    2926=    2927=    2928=    2929=    2930=    2931=
U 10B0           2932=    2933=    2935=    2936=    2973=    2974=    2977=    2978=
U 10B8           2979=    2980=    2989=    2990=    2991=    2992=    2993=    2994=
U 10C0           2996=    2997=    2999=    3006=    3007=    3008=    3009=    3010=
U 10C8           3011=    3012=    3013=    3014=    3015=    3016=    3018=    3019=
U 10D0           3065=    3066=    3068=    3069=    3071=    3072=    3080=    3081=
U 10D8           3084=    3085=    3086=    3087=    3088=    3089=    3093=    3094=
U 10E0           3102=    3103=    3107=    3111=    3129=    3130=    3133=    3134=
U 10E8           3135=    3136=    3137=    3138=    3139=    3140=    3143=    3144=
U 10F0           3153=    3154=    3160=    3161=    3165=    3166=    3167=    3168=
U 10F8           3169=    3170=    3171=    3172=    3173=    3174=    3175=    3176=
U 1100           1831:    1832:    1833:    1834:    1835:    1836:    1837:    1838:
U 1108           1839:    1882     3177=    3178=    1840:    1841:    1842:    1843:
U 1110           3181=    3182=    3187=    3188=    3317=    3318=    3320=    3321=
U 1118           3322=    3324=    3333=    3334=    3335=    3336=    3337=    3338=
U 1120           3339=    3341=    3342=    3343=    3345=    3351=    3358=    3365=
U 1128           3367=    3368=    3370=    3371=    3372=    3373=    3374=    3375=
U 1130           3376=    3377=    3378=    3379=    3381=    3387=    3394=    3401=
U 1138           3404=    3405=    3406=    3407=    3408=    3409=    3410=    3411=
U 1140           3412=    3413=    3414=    3415=    3417=    3423=    3430=    3431=
U 1148           3503=    3504=    3511=    3512=    3514=    3515=    3531=    3532=
U 1150           3534=    3535=    3536=    3537=    1883     2255:    3539=    3543=
U 1158           3547=    3548=    3550=    3551=    3556=    3557=    3560=    3561=
U 1160           3628=    3629=    3636=    3637=    3639=    3640=    3646=    3647=
U 1168           3648=    3649=    3650=    3651=    3653=    3654=    3657=    3658=
U 1170           3664=    3665=    3669=    3670=    3671=    3672=    3674=    3675=
U 1178           3678=    3679=    3686=    3687=    3691=    3692=    3693=    3694=
U 1180           3696=    3697=    3700=    3701=    3707=    3708=    3712=    3713=
U 1188           3714=    3715=    3717=    3718=    3721=    3723=    1897     1898
U 1190           1899     1900     1901     1902     1903     1904     1905     1906
U 1198           1907     1908     1909     1910     1911     1912     1913     1914
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0           1915    1916    1917    1918    1919    1922    1923    1966
U 11A8           1967    1968    1969    1970    1971    1972    1973    1974
U 11B0           1975    1976    1977    1978    1979    1980    1981    1983
U 11B8           1984    1985    1986    1988    1998    1999    2007    2008
U 11C0           2009    2029    2030    2031    2032    2038    2039    2040
U 11C8           2041    2056    2057    2058    2059    2062    2063    2064
U 11D0           2065    2079    2348    2349    2350    2351    2352    2363
U 11D8           2364    2365    2366    2367    2368    2369    2373    2382
U 11E0           2383    2384    2385    2386    2387    2388    2389    2390
U 11E8           2445    2467    2490    2507    2508    2509    2514    2515
U 11F0           2516    2517    2520    2529    2540    2541    2542    2543
U 11F8           2546    2582    2593    2594    2595    2596    2605    2608
U 1200           2084:   2085:   2086:   2087:   2088:   2089:   2090:   2091:
U 1208           2092:   2093:   2094:   2095:   2096:   2097:   2098:   2099:
U 1210           2100:   2101:   2102:   2103:   2104:   2105:   2106:   2107:
U 1218           2108:   2109:   2110:   2111:   2112:   2113:   2114:   2115:
U 1220           2116:   2117:   2118:   2119:   2120:   2121:   2122:   2123:
U 1228           2124:   2125:   2126:   2127:   2128:   2129:   2130:   2131:
U 1230           2132:   2133:   2134:   2135:   2136:   2137:   2138:   2139:
U 1238           2140:   2141:   2142:   2143:   2144:   2145:   2146:   2147:
U 1240           2148:   2149:   2150:   2151:   2152:   2153:   2154:   2155:
U 1248           2156:   2157:   2158:   2159:   2160:   2161:   2162:   2163:
U 1250           2164:   2165:   2166:   2167:   2168:   2169:   2170:   2171:
U 1258           2172:   2173:   2174:   2175:   2176:   2177:   2178:   2179:
U 1260           2180:   2181:   2182:   2183:   2184:   2185:   2186:   2187:
U 1268           2188:   2189:   2190:   2191:   2192:   2193:   2194:   2195:
U 1270           2196:   2197:   2198:   2199:   2200:   2201:   2202:   2203:
U 1278           2204:   2205:   2206:   2207:   2208:   2209:   2210:   2211:
U 1280           2212:   2213:   2214:   2215:   2216:   2217:   2218:   2219:
U 1288           2220:   2221:   2222:   2223:   2224:   2225:   2226:   2227:
U 1290           2228:   2229:   2230:   2231:   2232:   2233:   2234:   2235:
U 1298           2236:   2237:   2238:   2239:   2240:   2241:   2242:   2243:
U 12A0           2244:   2245:   2246:   2247:   2248:   2249:   2250:   2251:
U 12A8           2252:   2253:   2254:   2256:   2257:   2258:   2259:   2260:
U 12B0           2261:   2262:   2263:   2264:   2265:   2266:   2267:   2268:
U 12B8           2269:   2270:   2271:   2272:   2273:   2274:   2275:   2276:
U 12C0           2277:   2278:   2279:   2280:   2281:   2282:   2283:   2284:
U 12C8           2285:   2286:   2287:   2288:   2289:   2290:   2291:   2292:
U 12D0           2293:   2294:   2295:   2296:   2297:   2298:   2299:   2300:
U 12D8           2301:   2302:   2303:   2304:   2305:   2306:   2307:   2308:
U 12E0           2309:   2310:   2311:   2312:   2313:   2314:   2315:   2316:
U 12E8           2317:   2318:   2319:   2320:   2321:   2322:   2323:   2324:
U 12F0           2325:   2326:   2327:   2328:   2329:   2330:   2331:   2332:
U 12F8           2333:   2334:   2335:   2336:   2337:   2338:   2339:   2340:
U 1300           2609    2610    2611    2612    2613    2695    2708    2709
U 1308           2710    2711    2712    2713    2714    2719    2720    2721
U 1310           2726    2729    2730    2731    2732    2733    2734    2735
U 1318           2736    2795    2804    2805    2806    2807    2808    2819
U 1320           2822    2823    2824    2825    2826    2827    2910    2913
U 1328           2914    2915    2934    2975    2976    2981    2995    2998
U 1330           3017    3067    3070    3079    3082    3083    3090    3091
U 1338           3092    3095    3096    3097    3098    3100    3101    3105
U 1340           3106    3118    3119    3120    3121    3131    3132    3141
```

```
;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 1348           3142     3155     3156     3157     3158     3159     3162     3163
U 1350           3164     3179     3180     3183     3184     3185     3186     3319
U 1358           3325     3344     3352     3353     3354     3355     3356     3357
U 1360           3366     3369     3380     3388     3389     3390     3391     3392
U 1368           3393     3402     3403     3416     3424     3425     3426     3427
U 1370           3428     3429     3510     3513     3516     3517     3518     3519
U 1378           3522     3523     3524     3525     3526     3527     3528     3529
U 1380           3530     3533     3538     3544     3545     3546     3549     3552
U 1388           3553     3554     3555     3559     3563     3574     3635     3638
U 1390           3652     3655     3656     3666     3667     3668     3673     3676
U 1398           3677     3688     3689     3690     3695     3698     3699     3709
U 13A0           3710     3711     3716     3719     3720     3737
U 13A8 - 13DF Unused
U 13E0           2016:    2017:    2018:    2019:    2020:    2021:    2022:    2023:
U 13E8 - 13EF Unused
U 13F0           1934:    1935:    1936:    1937:    1938:    1939:    1940:    1941:
U 13F8           1942:    1943:    1944:    1945:    1946:    1947:    1948:    1949:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH36        958

Used             958
Remaining

Total microwords used in memory U: 958
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH36.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3      Control ROM Field Definitions
; 548    Register Transfer Macro Definitions
; 1413   Non-transfer Functions
; 1485   Branch Enable Macro Definitions
; 1564   MICRO DIAGNOSTIC DEFINED MACROS
; 2309   TEST 131         IB REQUEST AND COUNT TEST
; 2576   TEST 132         VAX MODE SPECIFIER 1 CONSTANT
; 2639   TEST 133         COMPATABILITY MODE SP1 AND SP2 CONSTANTS
; 2780   TEST 134         PC REGISTER INCREMENT BY 'N'
; 2851   TEST 135         INSTRUCTION DEPENDENT SCRATCH PAD ADDRESSING
; 3344   TEST 136         BMUX GETS PC OR LB FUNCTION
; 3409   TEST 137         SHIFTER SELECT ON INSTRUCTION DEPENDENT DATA TYPE
; 3475   TEST 138         COMPATABILITY MODE CONTEXT LATCH
```

```
                                        ;1      .NOLIST
                                        ;1804   .LIST
                                        ;1805
```

```
                                         .REGION/1000,13FF

                                         ;+
                                         ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                         ; WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
                                         ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                         ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                         ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                         ;
                                         ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                         ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                         ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                         ;       R[OF] AND DO A RETURNO.
                                         ;
                                         ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                         ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                         ; TO THE CONSOLE.
                                         ;
                                         ; THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
                                         ; ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURNO IF THE TRAP WAS
                                         ; EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
                                         ; RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
                                         ; STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.
                                         ;-

U 1100, 0000,003C,19C0,0A78,0084,7001    1100:   SC_K[ZERO],Q_R[OF],J/TRPHO      ; SYSTEM INIT
U 1101, 0000,003C,05C0,0A78,0084,7001    1101:   SC_K[.1],Q_R[OF],J/TRPHO        ; DATA UNALIGNED
U 1102, 0000,003C,09C0,0A78,0084,7001    1102:   SC_K[.2],Q_R[OF],J/TRPHO        ; X PAGE ERROR
U 1103, 0000,003C,0DC0,0A78,0084,7001    1103:   SC_K[.3],Q_R[OF],J/TRPHO        ; TB MODIFY
U 1104, 0000,003C,11C0,0A78,0084,7001    1104:   SC_K[.4],Q_R[OF],J/TRPHO        ; TB PROT ERROR
U 1105, 0000,003C,D5C0,0A78,0084,7001    1105:   SC_K[.6],Q_R[OF],J/TRPHO        ; TB MISS
U 1106, 0000,003C,D9C0,0A78,0084,7001    1106:   SC_K[.9],Q_R[OF],J/TRPHO        ; RES FLOAT OPER
U 1107, 0000,003C,5DC0,0A78,0084,7001    1107:   SC_K[.7],Q_R[OF],J/TRPHO        ; TB PARITY
U 1108, 0000,003C,01C0,0A78,0084,7001    1108:   SC_K[.8],Q_R[OF],J/TRPHO        ; CACHE PARITY
U 110C, 0000,003C,85C0,0A78,0084,7001    110C:   SC_K[.C],Q_R[OF],J/TRPHO        ; RDS
U 110D, 0000,003C,89C0,0A78,0084,7001    110D:   SC_K[.D],Q_R[OF],J/TRPHO        ; TIME OUT
U 110E, 0000,003C,65C0,0A78,0084,7001    110E:   SC_K[.10],Q_R[OF],J/TRPHO       ; ODD ADDRESS
U 110F, 0000,003C,61C0,0A78,0084,7159    110F:   SC_K[.F],Q_R[OF],J/TRPH2        ; CS PARITY

U 1001, 0001,2024,0180,0800,0010,104F    TRPHO:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 104F, 0000,013C,0180,0800,0000,1002            Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000    =0      ALU_Q[AND]MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN


                                         ;+
                                         ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                         ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                         ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                         ;
                                         ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                         ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                         ;             FAULT STATUS REGISTER
                                         ;             SBI ERROR REGISTER
                                         ;             TIMEOUT ADDRESS REGISTER
                                         ;             MAINTENANCE REGISTER
```

```
                                           ;1861    ;               CACHE PARITY REGISTER
                                           ;1862    ;               TB ERROR REGISTER 1
                                           ;1863    ;               TB ERROR REGISTER 0
                                           ;1864    ;-
                                           ;1865
U 1003, 0018,0038,1D80,09E8,0000,1004      ;1866    TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,718B      ;1867    =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,105B      ;1868            Q_ID[TBER0]
U 105B, 0001,203C,4DF0,2DB0,0000,105F      ;1869            RC[6]_Q,Q_ID[TBER1]
U 105F, 0001,203C,65F0,2DB8,0000,1109      ;1870            RC[7]_Q,Q_ID[SBI.ERR]
U 1109, 0001,203C,6DF0,2DD8,0000,1154      ;1871            RC[0B]_Q,Q_ID[FAULT]
U 1154, 0001,203C,75F0,2DE0,0000,1156      ;1872            RC[0C]_Q,Q_ID[MAINT]
U 1156, 0001,203C,79F0,2DC8,0000,1157      ;1873            RC[9]_Q,Q_ID[PARITY]
U 1157, 0001,203C,69F0,2DC0,0000,1158      ;1874            RC[8]_Q,Q_ID[TIME.ADDR]
U 1158, 0001,203C,81F0,2DD0,0000,1000      ;1875            RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1170      ;1876    1000:   RC[0E]_Q,ERROR1
                                           ;1877
                                           ;1878    ;+
                                           ;1879    ; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
                                           ;1880    ;-
                                           ;1881
U 1159, 0001,2024,0180,0800,0010,115A      ;1882    TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS THE TRAP EXPECTED?
U 115A, 0000,013C,0180,0800,0000,1006      ;1883            Z?                              ; BRANCH IF NO
U 1006, 0001,2036,0180,0AF8,0000,0001      ;1884    =0      ALU_Q[AND]MASK,R[0F]_ALU,RETURN1 ; RETURN
U 1007, 0000,003C,0180,0800,0000,1003      ;1885            J/TRPH1                         ; REPORT UNEXPECTED TRAP
                                           ;1886
                                           ;1887
                                           ;1888    ;+
                                           ;1889    ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                           ;1890    ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                           ;1891    ;                 NEWTST
                                           ;1892    ;                 ERLOOP
                                           ;1893    ;                 ERROR1
                                           ;1894    ;                 ERROR2
                                           ;1895    ;
                                           ;1896
U 115B, 0000,003C,65F8,0800,0084,715C      ;1897    SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 115C, 0818,0038,8D80,0800,0000,115D      ;1898            D_K[.1F]                        ; ...
U 115D, 0D00,003C,0180,0800,0000,115E      ;1899            D_DAL.SC
U 115E, 0000,003C,3D80,3C00,0000,115F      ;1900            ID[PSL]_D                       ; WRITE THE PSL
U 115F, 0818,0038,0580,0800,0000,1160      ;1901            D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 1160, 0D00,003C,0180,0800,0000,1161      ;1902            D_DAL.SC
U 1161, 0F00,003C,3180,3C00,0000,1162      ;1903            ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 1162, 0000,003C,5D80,3C00,0000,1163      ;1904            ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 1163, 0000,003C,3980,3C00,0000,1164      ;1905            ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 1164, 0000,003C,2980,3C00,0000,1165      ;1906            ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 1165, 0000,003C,4980,3C00,0000,1166      ;1907            ID[TBER0]_D                     ; SHUT OFF THE TB
U 1166, 0000,003C,7180,3C00,0000,1167      ;1908            ID[COMP]_D                      ; CLEAR SILO COMPARATOR
U 1167, 0818,0038,C180,0800,0000,1168      ;1909            D_K[.FFFF]
U 1168, 0000,003C,6580,3C00,0000,1169      ;1910            ID[SBI.ERR]_D
U 1169, 0F00,003C,6D80,3C00,0000,116A      ;1911            ID[FAULT]_D,D_0
U 116A, 0000,003C,6D80,3C00,0000,116B      ;1912            ID[FAULT]_D
U 116B, 0000,003C,6580,3C00,0000,116C      ;1913            ID[SBI.ERR]_D
U 116C, 0003,003C,0180,09F0,0000,116D      ;1914            RC[0E]_0
U 116D, 0003,003C,0180,0AF8,0000,116E      ;1915            R[0F]_0
```

```
U 116E, 0003,003C,0180,09E8,0000,105E    ;1916           RC[OD]_0,J/CALLCON              ; CALL THE CONSOLE
U 116F, 0818,0038,0980,0800,0000,105E    ;1917   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 1170, 0810,0038,0180,0978,0000,1171    ;1918   ERROR1: D_RC[OF]
U 1171, 0819,0034,4D80,0800,0000,104E    ;1919           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E    ;1920   104E:   D_D.OR.K[.4],J/CALLCON
                                         ;1921
U 1172, 0810,0038,0180,0978,0000,1173    ;1922   ERROR2: D_RC[OF]
U 1173, 0819,0034,4D80,0800,0000,105A    ;1923           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E    ;1924   105A:   D_D.OR.K[.6],J/CALLCON
                                         ;1925
                                         ;1926   105E:
                                         ;1927   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E    ;1928           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                         ;1929
                                         ;1930   ;+
                                         ;1931   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                         ;1932   ;-
                                         ;1933
U 13F0, 0000,003C,0180,0800,0000,13F1    ;1934   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2    ;1935   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3    ;1936   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4    ;1937   13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5    ;1938   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6    ;1939   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7    ;1940   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8    ;1941   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9    ;1942   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA    ;1943   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB    ;1944   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC    ;1945   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD    ;1946   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE    ;1947   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF    ;1948   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1174    ;1949   13FF:   NOP
                                         ;1950
                                         ;1951
                                         ;1952   ;+
                                         ;1953   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
                                         ;1954   ; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
                                         ;1955   ; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
                                         ;1956   ; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
                                         ;1957   ;
                                         ;1958   ; FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
                                         ;1959   ;       THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
                                         ;1960   ;
                                         ;1961   ;               =0      D_0,CALL,J/DC5
                                         ;1962   ;                       NOP
                                         ;1963   ;               =0      CALL,J/DC5
                                         ;1964   ;-
                                         ;1965
U 1174, 0018,0038,1980,0800,0000,1184    ;1966   DC0:    ALU_0(K),J/S00
U 1175, 0018,0038,1980,0800,0000,1185    ;1967   DC1:    ALU_0(K),J/S01
U 1176, 0018,0038,1980,0800,0000,1186    ;1968   DC2:    ALU_0(K),J/S10
U 1177, 0018,0038,1980,0800,0000,1187    ;1969   DC3:    ALU_0(K),J/S11
U 1178, 0018,0038,0980,0800,0000,1184    ;1970   DC4:    ALU_K[.2],J/S00
```

```
U 1179, 0018,0038,0980,0800,0000,1185    DC5:    ALU_K[.2],J/S01
U 117A, 0018,0038,0980,0800,0000,1186    DC6:    ALU_K[.2],J/S10
U 117B, 0018,0038,0980,0800,0000,1187    DC7:    ALU_K[.2],J/S11
U 117C, 0018,0038,0580,0800,0000,1184    DC8:    ALU_K[.1],J/S00
U 117D, 0018,0038,0580,0800,0000,1185    DC9:    ALU_K[.1],J/S01
U 117E, 0018,0038,0580,0800,0000,1186    DCA:    ALU_K[.1],J/S10
U 117F, 0018,0038,0580,0800,0000,1187    DCB:    ALU_K[.1],J/S11
U 1180, 0018,0038,C180,0800,0000,1184    DCC:    ALU_K[.FFFF],J/S00
U 1181, 0018,0038,C180,0800,0000,1185    DCD:    ALU_K[.FFFF],J/S01
U 1182, 0018,0038,C180,0800,0000,1186    DCE:    ALU_K[.FFFF],J/S10
U 1183, 0018,0038,C180,0800,0000,1187    DCF:    ALU_K[.FFFF],J/S11

U 1184, 0118,0038,1B80,0800,0000,1188    S00:    ALU_O(K),D_D.LEFT2,SI/7,J/SX
U 1185, 0118,0038,0B80,0800,0000,1188    S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1186, 0118,0038,078C,0800,0000,1188    S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 1187, 0118,0038,C380,0800,0000,1188    S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX

U 1188, 0100,003E,0380,0800,0000,0001    SX:     D_D.LEFT2,SI/7,RETURN1          ; EXIT


                                         ;+
                                         ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                         ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                         ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                         ; TYPING IT.
                                         ;-

U 1189, 0810,0038,4D80,0978,0000,118A    SUBTST: D_RC[OF],KMX/.FF00
U 118A, 0019,4016,4D80,09F8,0000,0001            RC[OF]_D+K[.FF00],WORD,RETURN1

                                         ;+
                                         ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                         ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                         ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                         ;-

U 118B, 0010,0038,01C0,0978,0000,118C    SETRCF: Q_RC[OF]
U 118C, 0019,2034,4DC0,0800,0000,118D            Q_Q.AND.K[.FF00]
U 118D, 0019,2032,1D80,09F8,0000,0001            RC[OF]_Q.OR.SC,RETURN1
```

```
                                              ;2011
U 1155, 0019,2000,05C0,0800,0000,12AB         ;2012   1155:   Q_Q-K[.1],J/12AB
                                              ;2013   ;+
                                              ;2014   ; THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
                                              ;2015   ; THE INSTRUCTION AT LOCATION "DISPAT" LOADS THE Q REGISTER WITH HEX 100
                                              ;2016   ; AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
                                              ;2017   ; THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
                                              ;2018   ; THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
                                              ;2019   ; THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.
                                              ;2020   ;-
                                              ;2021
                                              ;2022   SYNC00:
U 118E, 0038,003B,41C0,0800,0000,1200         ;2023   DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/DISPATTBL
                                              ;2024
                                              ;2025
                                              ;2026   1200:
                                              ;2027   DISPATTBL:
U 1200, 0019,2000,05C0,0800,0000,1201         ;2028   1200:   Q_Q-K[.1]
U 1201, 0019,2000,05C0,0800,0000,1202         ;2029   1201:   Q_Q-K[.1]
U 1202, 0019,2000,05C0,0800,0000,1203         ;2030   1202:   Q_Q-K[.1]
U 1203, 0019,2000,05C0,0800,0000,1204         ;2031   1203:   Q_Q-K[.1]
U 1204, 0019,2000,05C0,0800,0000,1205         ;2032   1204:   Q_Q-K[.1]
U 1205, 0019,2000,05C0,0800,0000,1206         ;2033   1205:   Q_Q-K[.1]
U 1206, 0019,2000,05C0,0800,0000,1207         ;2034   1206:   Q_Q-K[.1]
U 1207, 0019,2000,05C0,0800,0000,1208         ;2035   1207:   Q_Q-K[.1]
U 1208, 0019,2000,05C0,0800,0000,1209         ;2036   1208:   Q_Q-K[.1]
U 1209, 0019,2000,05C0,0800,0000,120A         ;2037   1209:   Q_Q-K[.1]
U 120A, 0019,2000,05C0,0800,0000,120B         ;2038   120A:   Q_Q-K[.1]
U 120B, 0019,2000,05C0,0800,0000,120C         ;2039   120B:   Q_Q-K[.1]
U 120C, 0019,2000,05C0,0800,0000,120D         ;2040   120C:   Q_Q-K[.1]
U 120D, 0019,2000,05C0,0800,0000,120E         ;2041   120D:   Q_Q-K[.1]
U 120E, 0019,2000,05C0,0800,0000,120F         ;2042   120E:   Q_Q-K[.1]
U 120F, 0019,2000,05C0,0800,0000,1210         ;2043   120F:   Q_Q-K[.1]
U 1210, 0019,2000,05C0,0800,0000,1211         ;2044   1210:   Q_Q-K[.1]
U 1211, 0019,2000,05C0,0800,0000,1212         ;2045   1211:   Q_Q-K[.1]
U 1212, 0019,2000,05C0,0800,0000,1213         ;2046   1212:   Q_Q-K[.1]
U 1213, 0019,2000,05C0,0800,0000,1214         ;2047   1213:   Q_Q-K[.1]
U 1214, 0019,2000,05C0,0800,0000,1215         ;2048   1214:   Q_Q-K[.1]
U 1215, 0019,2000,05C0,0800,0000,1216         ;2049   1215:   Q_Q-K[.1]
U 1216, 0019,2000,05C0,0800,0000,1217         ;2050   1216:   Q_Q-K[.1]
U 1217, 0019,2000,05C0,0800,0000,1218         ;2051   1217:   Q_Q-K[.1]
U 1218, 0019,2000,05C0,0800,0000,1219         ;2052   1218:   Q_Q-K[.1]
U 1219, 0019,2000,05C0,0800,0000,121A         ;2053   1219:   Q_Q-K[.1]
U 121A, 0019,2000,05C0,0800,0000,121B         ;2054   121A:   Q_Q-K[.1]
U 121B, 0019,2000,05C0,0800,0000,121C         ;2055   121B:   Q_Q-K[.1]
U 121C, 0019,2000,05C0,0800,0000,121D         ;2056   121C:   Q_Q-K[.1]
U 121D, 0019,2000,05C0,0800,0000,121E         ;2057   121D:   Q_Q-K[.1]
U 121E, 0019,2000,05C0,0800,0000,121F         ;2058   121E:   Q_Q-K[.1]
U 121F, 0019,2000,05C0,0800,0000,1220         ;2059   121F:   Q_Q-K[.1]
U 1220, 0019,2000,05C0,0800,0000,1221         ;2060   1220:   Q_Q-K[.1]
U 1221, 0019,2000,05C0,0800,0000,1222         ;2061   1221:   Q_Q-K[.1]
U 1222, 0019,2000,05C0,0800,0000,1223         ;2062   1222:   Q_Q-K[.1]
U 1223, 0019,2000,05C0,0800,0000,1224         ;2063   1223:   Q_Q-K[.1]
U 1224, 0019,2000,05C0,0800,0000,1225         ;2064   1224:   Q_Q-K[.1]
U 1225, 0019,2000,05C0,0800,0000,1226         ;2065   1225:   Q_Q-K[.1]
```

```
U 1226, 0019,2000,05C0,0800,0000,1227    ;2066    1226:    Q_Q-K[.1]
U 1227, 0019,2000,05C0,0800,0000,1228    ;2067    1227:    Q_Q-K[.1]
U 1228, 0019,2000,05C0,0800,0000,1229    ;2068    1228:    Q_Q-K[.1]
U 1229, 0019,2000,05C0,0800,0000,122A    ;2069    1229:    Q_Q-K[.1]
U 122A, 0019,2000,05C0,0800,0000,122B    ;2070    122A:    Q_Q-K[.1]
U 122B, 0019,2000,05C0,0800,0000,122C    ;2071    122B:    Q_Q-K[.1]
U 122C, 0019,2000,05C0,0800,0000,122D    ;2072    122C:    Q_Q-K[.1]
U 122D, 0019,2000,05C0,0800,0000,122E    ;2073    122D:    Q_Q-K[.1]
U 122E, 0019,2000,05C0,0800,0000,122F    ;2074    122E:    Q_Q-K[.1]
U 122F, 0019,2000,05C0,0800,0000,1230    ;2075    122F:    Q_Q-K[.1]
U 1230, 0019,2000,05C0,0800,0000,1231    ;2076    1230:    Q_Q-K[.1]
U 1231, 0019,2000,05C0,0800,0000,1232    ;2077    1231:    Q_Q-K[.1]
U 1232, 0019,2000,05C0,0800,0000,1233    ;2078    1232:    Q_Q-K[.1]
U 1233, 0019,2000,05C0,0800,0000,1234    ;2079    1233:    Q_Q-K[.1]
U 1234, 0019,2000,05C0,0800,0000,1235    ;2080    1234:    Q_Q-K[.1]
U 1235, 0019,2000,05C0,0800,0000,1236    ;2081    1235:    Q_Q-K[.1]
U 1236, 0019,2000,05C0,0800,0000,1237    ;2082    1236:    Q_Q-K[.1]
U 1237, 0019,2000,05C0,0800,0000,1238    ;2083    1237:    Q_Q-K[.1]
U 1238, 0019,2000,05C0,0800,0000,1239    ;2084    1238:    Q_Q-K[.1]
U 1239, 0019,2000,05C0,0800,0000,123A    ;2085    1239:    Q_Q-K[.1]
U 123A, 0019,2000,05C0,0800,0000,123B    ;2086    123A:    Q_Q-K[.1]
U 123B, 0019,2000,05C0,0800,0000,123C    ;2087    123B:    Q_Q-K[.1]
U 123C, 0019,2000,05C0,0800,0000,123D    ;2088    123C:    Q_Q-K[.1]
U 123D, 0019,2000,05C0,0800,0000,123E    ;2089    123D:    Q_Q-K[.1]
U 123E, 0019,2000,05C0,0800,0000,123F    ;2090    123E:    Q_Q-K[.1]
U 123F, 0019,2000,05C0,0800,0000,1240    ;2091    123F:    Q_Q-K[.1]
U 1240, 0019,2000,05C0,0800,0000,1241    ;2092    1240:    Q_Q-K[.1]
U 1241, 0019,2000,05C0,0800,0000,1242    ;2093    1241:    Q_Q-K[.1]
U 1242, 0019,2000,05C0,0800,0000,1243    ;2094    1242:    Q_Q-K[.1]
U 1243, 0019,2000,05C0,0800,0000,1244    ;2095    1243:    Q_Q-K[.1]
U 1244, 0019,2000,05C0,0800,0000,1245    ;2096    1244:    Q_Q-K[.1]
U 1245, 0019,2000,05C0,0800,0000,1246    ;2097    1245:    Q_Q-K[.1]
U 1246, 0019,2000,05C0,0800,0000,1247    ;2098    1246:    Q_Q-K[.1]
U 1247, 0019,2000,05C0,0800,0000,1248    ;2099    1247:    Q_Q-K[.1]
U 1248, 0019,2000,05C0,0800,0000,1249    ;2100    1248:    Q_Q-K[.1]
U 1249, 0019,2000,05C0,0800,0000,124A    ;2101    1249:    Q_Q-K[.1]
U 124A, 0019,2000,05C0,0800,0000,124B    ;2102    124A:    Q_Q-K[.1]
U 124B, 0019,2000,05C0,0800,0000,124C    ;2103    124B:    Q_Q-K[.1]
U 124C, 0019,2000,05C0,0800,0000,124D    ;2104    124C:    Q_Q-K[.1]
U 124D, 0019,2000,05C0,0800,0000,124E    ;2105    124D:    Q_Q-K[.1]
U 124E, 0019,2000,05C0,0800,0000,124F    ;2106    124E:    Q_Q-K[.1]
U 124F, 0019,2000,05C0,0800,0000,1250    ;2107    124F:    Q_Q-K[.1]
U 1250, 0019,2000,05C0,0800,0000,1251    ;2108    1250:    Q_Q-K[.1]
U 1251, 0019,2000,05C0,0800,0000,1252    ;2109    1251:    Q_Q-K[.1]
U 1252, 0019,2000,05C0,0800,0000,1253    ;2110    1252:    Q_Q-K[.1]
U 1253, 0019,2000,05C0,0800,0000,1254    ;2111    1253:    Q_Q-K[.1]
U 1254, 0019,2000,05C0,0800,0000,1255    ;2112    1254:    Q_Q-K[.1]
U 1255, 0019,2000,05C0,0800,0000,1256    ;2113    1255:    Q_Q-K[.1]
U 1256, 0019,2000,05C0,0800,0000,1257    ;2114    1256:    Q_Q-K[.1]
U 1257, 0019,2000,05C0,0800,0000,1258    ;2115    1257:    Q_Q-K[.1]
U 1258, 0019,2000,05C0,0800,0000,1259    ;2116    1258:    Q_Q-K[.1]
U 1259, 0019,2000,05C0,0800,0000,125A    ;2117    1259:    Q_Q-K[.1]
U 125A, 0019,2000,05C0,0800,0000,125B    ;2118    125A:    Q_Q-K[.1]
U 125B, 0019,2000,05C0,0800,0000,125C    ;2119    125B:    Q_Q-K[.1]
U 125C, 0019,2000,05C0,0800,0000,125D    ;2120    125C:    Q_Q-K[.1]
```

```
U 125D, 0019,2000,05C0,0800,0000,125E    ;2121    125D:    Q_Q-K[.1]
U 125E, 0019,2000,05C0,0800,0000,125F    ;2122    125E:    Q_Q-K[.1]
U 125F, 0019,2000,05C0,0800,0000,1260    ;2123    125F:    Q_Q-K[.1]
U 1260, 0019,2000,05C0,0800,0000,1261    ;2124    1260:    Q_Q-K[.1]
U 1261, 0019,2000,05C0,0800,0000,1262    ;2125    1261:    Q_Q-K[.1]
U 1262, 0019,2000,05C0,0800,0000,1263    ;2126    1262:    Q_Q-K[.1]
U 1263, 0019,2000,05C0,0800,0000,1264    ;2127    1263:    Q_Q-K[.1]
U 1264, 0019,2000,05C0,0800,0000,1265    ;2128    1264:    Q_Q-K[.1]
U 1265, 0019,2000,05C0,0800,0000,1266    ;2129    1265:    Q_Q-K[.1]
U 1266, 0019,2000,05C0,0800,0000,1267    ;2130    1266:    Q_Q-K[.1]
U 1267, 0019,2000,05C0,0800,0000,1268    ;2131    1267:    Q_Q-K[.1]
U 1268, 0019,2000,05C0,0800,0000,1269    ;2132    1268:    Q_Q-K[.1]
U 1269, 0019,2000,05C0,0800,0000,126A    ;2133    1269:    Q_Q-K[.1]
U 126A, 0019,2000,05C0,0800,0000,126B    ;2134    126A:    Q_Q-K[.1]
U 126B, 0019,2000,05C0,0800,0000,126C    ;2135    126B:    Q_Q-K[.1]
U 126C, 0019,2000,05C0,0800,0000,126D    ;2136    126C:    Q_Q-K[.1]
U 126D, 0019,2000,05C0,0800,0000,126E    ;2137    126D:    Q_Q-K[.1]
U 126E, 0019,2000,05C0,0800,0000,126F    ;2138    126E:    Q_Q-K[.1]
U 126F, 0019,2000,05C0,0800,0000,1270    ;2139    126F:    Q_Q-K[.1]
U 1270, 0019,2000,05C0,0800,0000,1271    ;2140    1270:    Q_Q-K[.1]
U 1271, 0019,2000,05C0,0800,0000,1272    ;2141    1271:    Q_Q-K[.1]
U 1272, 0019,2000,05C0,0800,0000,1273    ;2142    1272:    Q_Q-K[.1]
U 1273, 0019,2000,05C0,0800,0000,1274    ;2143    1273:    Q_Q-K[.1]
U 1274, 0019,2000,05C0,0800,0000,1275    ;2144    1274:    Q_Q-K[.1]
U 1275, 0019,2000,05C0,0800,0000,1276    ;2145    1275:    Q_Q-K[.1]
U 1276, 0019,2000,05C0,0800,0000,1277    ;2146    1276:    Q_Q-K[.1]
U 1277, 0019,2000,05C0,0800,0000,1278    ;2147    1277:    Q_Q-K[.1]
U 1278, 0019,2000,05C0,0800,0000,1279    ;2148    1278:    Q_Q-K[.1]
U 1279, 0019,2000,05C0,0800,0000,127A    ;2149    1279:    Q_Q-K[.1]
U 127A, 0019,2000,05C0,0800,0000,127B    ;2150    127A:    Q_Q-K[.1]
U 127B, 0019,2000,05C0,0800,0000,127C    ;2151    127B:    Q_Q-K[.1]
U 127C, 0019,2000,05C0,0800,0000,127D    ;2152    127C:    Q_Q-K[.1]
U 127D, 0019,2000,05C0,0800,0000,127E    ;2153    127D:    Q_Q-K[.1]
U 127E, 0019,2000,05C0,0800,0000,127F    ;2154    127E:    Q_Q-K[.1]
U 127F, 0019,2000,05C0,0800,0000,1280    ;2155    127F:    Q_Q-K[.1]
U 1280, 0019,2000,05C0,0800,0000,1281    ;2156    1280:    Q_Q-K[.1]
U 1281, 0019,2000,05C0,0800,0000,1282    ;2157    1281:    Q_Q-K[.1]
U 1282, 0019,2000,05C0,0800,0000,1283    ;2158    1282:    Q_Q-K[.1]
U 1283, 0019,2000,05C0,0800,0000,1284    ;2159    1283:    Q_Q-K[.1]
U 1284, 0019,2000,05C0,0800,0000,1285    ;2160    1284:    Q_Q-K[.1]
U 1285, 0019,2000,05C0,0800,0000,1286    ;2161    1285:    Q_Q-K[.1]
U 1286, 0019,2000,05C0,0800,0000,1287    ;2162    1286:    Q_Q-K[.1]
U 1287, 0019,2000,05C0,0800,0000,1288    ;2163    1287:    Q_Q-K[.1]
U 1288, 0019,2000,05C0,0800,0000,1289    ;2164    1288:    Q_Q-K[.1]
U 1289, 0019,2000,05C0,0800,0000,128A    ;2165    1289:    Q_Q-K[.1]
U 128A, 0019,2000,05C0,0800,0000,128B    ;2166    128A:    Q_Q-K[.1]
U 128B, 0019,2000,05C0,0800,0000,128C    ;2167    128B:    Q_Q-K[.1]
U 128C, 0019,2000,05C0,0800,0000,128D    ;2168    128C:    Q_Q-K[.1]
U 128D, 0019,2000,05C0,0800,0000,128E    ;2169    128D:    Q_Q-K[.1]
U 128E, 0019,2000,05C0,0800,0000,128F    ;2170    128E:    Q_Q-K[.1]
U 128F, 0019,2000,05C0,0800,0000,1290    ;2171    128F:    Q_Q-K[.1]
U 1290, 0019,2000,05C0,0800,0000,1291    ;2172    1290:    Q_Q-K[.1]
U 1291, 0019,2000,05C0,0800,0000,1292    ;2173    1291:    Q_Q-K[.1]
U 1292, 0019,2000,05C0,0800,0000,1293    ;2174    1292:    Q_Q-K[.1]
U 1293, 0019,2000,05C0,0800,0000,1294    ;2175    1293:    Q_Q-K[.1]
```

```
U 1294, 0019,2000,05C0,0800,0000,1295   ;2176     1294:    Q_Q-K[.1]
U 1295, 0019,2000,05C0,0800,0000,1296   ;2177     1295:    Q_Q-K[.1]
U 1296, 0019,2000,05C0,0800,0000,1297   ;2178     1296:    Q_Q-K[.1]
U 1297, 0019,2000,05C0,0800,0000,1298   ;2179     1297:    Q_Q-K[.1]
U 1298, 0019,2000,05C0,0800,0000,1299   ;2180     1298:    Q_Q-K[.1]
U 1299, 0019,2000,05C0,0800,0000,129A   ;2181     1299:    Q_Q-K[.1]
U 129A, 0019,2000,05C0,0800,0000,129B   ;2182     129A:    Q_Q-K[.1]
U 129B, 0019,2000,05C0,0800,0000,129C   ;2183     129B:    Q_Q-K[.1]
U 129C, 0019,2000,05C0,0800,0000,129D   ;2184     129C:    Q_Q-K[.1]
U 129D, 0019,2000,05C0,0800,0000,129E   ;2185     129D:    Q_Q-K[.1]
U 129E, 0019,2000,05C0,0800,0000,129F   ;2186     129E:    Q_Q-K[.1]
U 129F, 0019,2000,05C0,0800,0000,12A0   ;2187     129F:    Q_Q-K[.1]
U 12A0, 0019,2000,05C0,0800,0000,12A1   ;2188     12A0:    Q_Q-K[.1]
U 12A1, 0019,2000,05C0,0800,0000,12A2   ;2189     12A1:    Q_Q-K[.1]
U 12A2, 0019,2000,05C0,0800,0000,12A3   ;2190     12A2:    Q_Q-K[.1]
U 12A3, 0019,2000,05C0,0800,0000,12A4   ;2191     12A3:    Q_Q-K[.1]
U 12A4, 0019,2000,05C0,0800,0000,12A5   ;2192     12A4:    Q_Q-K[.1]
U 12A5, 0019,2000,05C0,0800,0000,12A6   ;2193     12A5:    Q_Q-K[.1]
U 12A6, 0019,2000,05C0,0800,0000,12A7   ;2194     12A6:    Q_Q-K[.1]
U 12A7, 0019,2000,05C0,0800,0000,12A8   ;2195     12A7:    Q_Q-K[.1]
U 12A8, 0019,2000,05C0,0800,0000,12A9   ;2196     12A8:    Q_Q-K[.1]
U 12A9, 0019,2000,05C0,0800,0000,12AA   ;2197     12A9:    Q_Q-K[.1]
U 12AA, 0019,2000,05C0,0800,0000,12AB   ;2198     12AA:    Q_Q-K[.1]
U 12AB, 0019,2000,05C0,0800,0000,12AC   ;2199     12AB:    Q_Q-K[.1]
U 12AC, 0019,2000,05C0,0800,0000,12AD   ;2200     12AC:    Q_Q-K[.1]
U 12AD, 0019,2000,05C0,0800,0000,12AE   ;2201     12AD:    Q_Q-K[.1]
U 12AE, 0019,2000,05C0,0800,0000,12AF   ;2202     12AE:    Q_Q-K[.1]
U 12AF, 0019,2000,05C0,0800,0000,12B0   ;2203     12AF:    Q_Q-K[.1]
U 12B0, 0019,2000,05C0,0800,0000,12B1   ;2204     12B0:    Q_Q-K[.1]
U 12B1, 0019,2000,05C0,0800,0000,12B2   ;2205     12B1:    Q_Q-K[.1]
U 12B2, 0019,2000,05C0,0800,0000,12B3   ;2206     12B2:    Q_Q-K[.1]
U 12B3, 0019,2000,05C0,0800,0000,12B4   ;2207     12B3:    Q_Q-K[.1]
U 12B4, 0019,2000,05C0,0800,0000,12B5   ;2208     12B4:    Q_Q-K[.1]
U 12B5, 0019,2000,05C0,0800,0000,12B6   ;2209     12B5:    Q_Q-K[.1]
U 12B6, 0019,2000,05C0,0800,0000,12B7   ;2210     12B6:    Q_Q-K[.1]
U 12B7, 0019,2000,05C0,0800,0000,12B8   ;2211     12B7:    Q_Q-K[.1]
U 12B8, 0019,2000,05C0,0800,0000,12B9   ;2212     12B8:    Q_Q-K[.1]
U 12B9, 0019,2000,05C0,0800,0000,12BA   ;2213     12B9:    Q_Q-K[.1]
U 12BA, 0019,2000,05C0,0800,0000,12BB   ;2214     12BA:    Q_Q-K[.1]
U 12BB, 0019,2000,05C0,0800,0000,12BC   ;2215     12BB:    Q_Q-K[.1]
U 12BC, 0019,2000,05C0,0800,0000,12BD   ;2216     12BC:    Q_Q-K[.1]
U 12BD, 0019,2000,05C0,0800,0000,12BE   ;2217     12BD:    Q_Q-K[.1]
U 12BE, 0019,2000,05C0,0800,0000,12BF   ;2218     12BE:    Q_Q-K[.1]
U 12BF, 0019,2000,05C0,0800,0000,12C0   ;2219     12BF:    Q_Q-K[.1]
U 12C0, 0019,2000,05C0,0800,0000,12C1   ;2220     12C0:    Q_Q-K[.1]
U 12C1, 0019,2000,05C0,0800,0000,12C2   ;2221     12C1:    Q_Q-K[.1]
U 12C2, 0019,2000,05C0,0800,0000,12C3   ;2222     12C2:    Q_Q-K[.1]
U 12C3, 0019,2000,05C0,0800,0000,12C4   ;2223     12C3:    Q_Q-K[.1]
U 12C4, 0019,2000,05C0,0800,0000,12C5   ;2224     12C4:    Q_Q-K[.1]
U 12C5, 0019,2000,05C0,0800,0000,12C6   ;2225     12C5:    Q_Q-K[.1]
U 12C6, 0019,2000,05C0,0800,0000,12C7   ;2226     12C6:    Q_Q-K[.1]
U 12C7, 0019,2000,05C0,0800,0000,12C8   ;2227     12C7:    Q_Q-K[.1]
U 12C8, 0019,2000,05C0,0800,0000,12C9   ;2228     12C8:    Q_Q-K[.1]
U 12C9, 0019,2000,05C0,0800,0000,12CA   ;2229     12C9:    Q_Q-K[.1]
U 12CA, 0019,2000,05C0,0800,0000,12CB   ;2230     12CA:    Q_Q-K[.1]
```

```
U 12CB, 0019,2000,05C0,0800,0000,12CC   ;2231   12CB:   Q_Q-K[.1]
U 12CC, 0019,2000,05C0,0800,0000,12CD   ;2232   12CC:   Q_Q-K[.1]
U 12CD, 0019,2000,05C0,0800,0000,12CE   ;2233   12CD:   Q_Q-K[.1]
U 12CE, 0019,2000,05C0,0800,0000,12CF   ;2234   12CE:   Q_Q-K[.1]
U 12CF, 0019,2000,05C0,0800,0000,12D0   ;2235   12CF:   Q_Q-K[.1]
U 12D0, 0019,2000,05C0,0800,0000,12D1   ;2236   12D0:   Q_Q-K[.1]
U 12D1, 0019,2000,05C0,0800,0000,12D2   ;2237   12D1:   Q_Q-K[.1]
U 12D2, 0019,2000,05C0,0800,0000,12D3   ;2238   12D2:   Q_Q-K[.1]
U 12D3, 0019,2000,05C0,0800,0000,12D4   ;2239   12D3:   Q_Q-K[.1]
U 12D4, 0019,2000,05C0,0800,0000,12D5   ;2240   12D4:   Q_Q-K[.1]
U 12D5, 0019,2000,05C0,0800,0000,12D6   ;2241   12D5:   Q_Q-K[.1]
U 12D6, 0019,2000,05C0,0800,0000,12D7   ;2242   12D6:   Q_Q-K[.1]
U 12D7, 0019,2000,05C0,0800,0000,12D8   ;2243   12D7:   Q_Q-K[.1]
U 12D8, 0019,2000,05C0,0800,0000,12D9   ;2244   12D8:   Q_Q-K[.1]
U 12D9, 0019,2000,05C0,0800,0000,12DA   ;2245   12D9:   Q_Q-K[.1]
U 12DA, 0019,2000,05C0,0800,0000,12DB   ;2246   12DA:   Q_Q-K[.1]
U 12DB, 0019,2000,05C0,0800,0000,12DC   ;2247   12DB:   Q_Q-K[.1]
U 12DC, 0019,2000,05C0,0800,0000,12DD   ;2248   12DC:   Q_Q-K[.1]
U 12DD, 0019,2000,05C0,0800,0000,12DE   ;2249   12DD:   Q_Q-K[.1]
U 12DE, 0019,2000,05C0,0800,0000,12DF   ;2250   12DE:   Q_Q-K[.1]
U 12DF, 0019,2000,05C0,0800,0000,12E0   ;2251   12DF:   Q_Q-K[.1]
U 12E0, 0019,2000,05C0,0800,0000,12E1   ;2252   12E0:   Q_Q-K[.1]
U 12E1, 0019,2000,05C0,0800,0000,12E2   ;2253   12E1:   Q_Q-K[.1]
U 12E2, 0019,2000,05C0,0800,0000,12E3   ;2254   12E2:   Q_Q-K[.1]
U 12E3, 0019,2000,05C0,0800,0000,12E4   ;2255   12E3:   Q_Q-K[.1]
U 12E4, 0019,2000,05C0,0800,0000,12E5   ;2256   12E4:   Q_Q-K[.1]
U 12E5, 0019,2000,05C0,0800,0000,12E6   ;2257   12E5:   Q_Q-K[.1]
U 12E6, 0019,2000,05C0,0800,0000,12E7   ;2258   12E6:   Q_Q-K[.1]
U 12E7, 0019,2000,05C0,0800,0000,12E8   ;2259   12E7:   Q_Q-K[.1]
U 12E8, 0019,2000,05C0,0800,0000,12E9   ;2260   12E8:   Q_Q-K[.1]
U 12E9, 0019,2000,05C0,0800,0000,12EA   ;2261   12E9:   Q_Q-K[.1]
U 12EA, 0019,2000,05C0,0800,0000,12EB   ;2262   12EA:   Q_Q-K[.1]
U 12EB, 0019,2000,05C0,0800,0000,12EC   ;2263   12EB:   Q_Q-K[.1]
U 12EC, 0019,2000,05C0,0800,0000,12ED   ;2264   12EC:   Q_Q-K[.1]
U 12ED, 0019,2000,05C0,0800,0000,12EE   ;2265   12ED:   Q_Q-K[.1]
U 12EE, 0019,2000,05C0,0800,0000,12EF   ;2266   12EE:   Q_Q-K[.1]
U 12EF, 0019,2000,05C0,0800,0000,12F0   ;2267   12EF:   Q_Q-K[.1]
U 12F0, 0019,2000,05C0,0800,0000,12F1   ;2268   12F0:   Q_Q-K[.1]
U 12F1, 0019,2000,05C0,0800,0000,12F2   ;2269   12F1:   Q_Q-K[.1]
U 12F2, 0019,2000,05C0,0800,0000,12F3   ;2270   12F2:   Q_Q-K[.1]
U 12F3, 0019,2000,05C0,0800,0000,12F4   ;2271   12F3:   Q_Q-K[.1]
U 12F4, 0019,2000,05C0,0800,0000,12F5   ;2272   12F4:   Q_Q-K[.1]
U 12F5, 0019,2000,05C0,0800,0000,12F6   ;2273   12F5:   Q_Q-K[.1]
U 12F6, 0019,2000,05C0,0800,0000,12F7   ;2274   12F6:   Q_Q-K[.1]
U 12F7, 0019,2000,05C0,0800,0000,12F8   ;2275   12F7:   Q_Q-K[.1]
U 12F8, 0019,2000,05C0,0800,0000,12F9   ;2276   12F8:   Q_Q-K[.1]
U 12F9, 0019,2000,05C0,0800,0000,12FA   ;2277   12F9:   Q_Q-K[.1]
U 12FA, 0019,2000,05C0,0800,0000,12FB   ;2278   12FA:   Q_Q-K[.1]
U 12FB, 0019,2000,05C0,0800,0000,12FC   ;2279   12FB:   Q_Q-K[.1]
U 12FC, 0019,2000,05C0,0800,0000,12FD   ;2280   12FC:   Q_Q-K[.1]
U 12FD, 0019,2000,05C0,0800,0000,12FE   ;2281   12FD:   Q_Q-K[.1]
U 12FE, 0019,2000,05C0,0800,0000,12FF   ;2282   12FE:   Q_Q-K[.1]
U 12FF, 0019,2002,05C0,0800,0000,0001   ;2283   12FF:   Q_Q-K[.1],RETURN1
                                        ;2284
                                        ;2285
```

```
U 118F, 0000,003C,3DF0,2C00,0000,1190   ;2286   SETCM:  Q_ID[PSL]
U 1190, 0000,003C,8D80,0800,0084,7191   ;2287           SC_K[.1F]
U 1191, 0803,001C,0180,0800,0000,1192   ;2288           D_NOT.MASK
U 1192, 081D,0030,0180,0800,0000,1193   ;2289           D_D.OR.Q
U 1193, 0000,003E,3D80,3C00,0000,0001   ;2290           ID[PSL]_D,RETURN1
                                        ;2291
                                        ;2292
                                        ;2293   ;+
                                        ;2294   ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
                                        ;2295   ; CACHE REFERANCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
                                        ;2296   ; IS COMPLETELY FULL OF DATA.
                                        ;2297   ;
                                        ;2298   ; BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
                                        ;2299   ;-
                                        ;2300
U 1194, 3000,003C,0180,6000,0000,1195   ;2301   IBWAIT: LOAD.IB,IBC/START
U 1195, 0000,003C,0180,F800,0000,1196   ;2302           MCT/ALLOW.IB.READ
U 1196, 0000,003C,0180,F800,0000,1197   ;2303           MCT/ALLOW.IB.READ
U 1197, 0000,003C,0180,F800,0000,1198   ;2304           MCT/ALLOW.IB.READ
U 1198, 0000,003C,0180,F800,0000,1199   ;2305           MCT/ALLOW.IB.READ
U 1199, 0000,003C,0180,F800,0000,119A   ;2306           MCT/ALLOW.IB.READ
U 119A, 1000,003E,0180,F800,0000,0001   ;2307           MCT/ALLOW.IB.READ,IBC/STOP,RETURN1
                                        ;2308
                                        ;2309   .PAGE   "TEST 131       IB REQUEST AND COUNT TEST"
                                        ;2310   ;*************************************************************************
                                        ;2311   ;++
                                        ;2312   ;
                                        ;2313   ; TEST  131     IB REQUEST AND COUNT TEST
                                        ;2314   ;
                                        ;2315   ; TEST DESCRIPTION
                                        ;2316   ;
                                        ;2317   ;       THIS TEST CHECKS ALL THE CONDITIONS THAT CAUSE "IB REQ" AND
                                        ;2318   ;       "COUNT" TO ASCERT OR BE BLOCKED.
                                        ;2319   ;
                                        ;2320   ;       SUBTEST 1 - IB RUNNING * BUFFER FULL * PC EVEN * -SAVE
                                        ;2321   ;                   CHECK THAT VIBA DOES NOT INCREMENT
                                        ;2322   ;       SUBTEST 2 - IB RUNNING * FLUSH
                                        ;2323   ;                   CHECK THAT PIBA DOES NOT INCREMENT
                                        ;2324   ;                   AND THAT THE BUFFER DOES NOT GET ANY DATA
                                        ;2325   ;       SUBTEST 3 - -IB RUNNING * BUFFER EMPTY * ALLOW.IB.READ
                                        ;2326   ;                   CHECK THAT THE BUFFER DOES NOT GET ANY DATA
                                        ;2327   ;       SUBTEST 4 - IB RUNNING * BUFFER FULL * BDEST * PC EVEN
                                        ;2328   ;                   CHECK THAT THE VIBA DOES NOT INCREMENT
                                        ;2329   ;       SUBTEST 5 - IB RUNNING * BUFFER FULL * -SAVE * -PC EVEN * CLR.0.1
                                        ;2330   ;                   CHECK THAT BYTE 7 GETS LOADED WITH VALID DATA
                                        ;2331   ;       SUBTEST 6 - IB RUNNING * BUFFER FULL * -SAVE * CLR.0-3
                                        ;2332   ;                   CHECK THAT THE VIBA INCREMENTS
                                        ;2333   ;       SUBTEST 7 - IB RUNNING * BUFFER FULL * SAVE * PC EVEN * CLR.1-5.COND
                                        ;2334   ;                   CHECK THAT THE VIBA DOES NOT INCREMENT
                                        ;2335   ;       SUBTEST 8 - CHECK THAT A FLUSH DURING "IB READ DATA" INHIBITS THE
                                        ;2336   ;                   VIBA FROM COUNTING.
                                        ;2337   ;       SUBTEST 9 - CHECK THAT THE VIBA DOES NOT INCREMENT WHEN THE
                                        ;2338   ;                   PC IS NOT EVEN AND BYTE 7 FILLS WITH DATA.
                                        ;2339   ;
                                        ;2340   ; LOGIC DESCRIPTION
                                        ;2341   ;
                                        ;2342   ;       THIS TEST CHECKS THE "IB REQ" AND "COUNT" LOGIC ON THE IDP MODULE.
                                        ;2343   ;
                                        ;2344   ; ERROR DESCRIPTION
                                        ;2345   ;
                                        ;2346   ;       DATA: EXPECTED VIBA OR UPC<7:0>
                                        ;2347   ;             RECEIVED VIBA OR UPC<7:0>
                                        ;2348   ;--
                                        ;2349   ;*************************************************************************
                                        ;2350   =0
U 1008, 0000,003D,0180,0800,0000,115B   ;2351   T131:   NEWTST
U 1009, 0018,0038,0980,09F8,0000,100A   ;2352           RC[OF]_K[.2]
U 100A, 0818,0039,5D80,0800,0000,1182   ;2353   =0      D_K[.7],CALL[DCE]               ; GENERATE STALL MICRO ADDRESS
U 100B, 0001,003C,0180,0A88,0000,119B   ;2354           R[1]_D                          ; SAVE
U 119B, 0018,0038,4180,0A80,0000,100C   ;2355           R[0]_K[.80]                     ; EQUALS 80
                                        ;2356
                                        ;2357   ;////////////////////////////////////////////////////////////////////////
                                        ;2358   ;+
                                        ;2359   ; CHECK THAT THE VIBA DOES NOT INCREMENT IF THE BUFFER IS FULL.
                                        ;2360   ;-
                                        ;2361
                                        ;2362   =0
U 100C, 0000,003D,0180,0800,0000,1189   ;2363   T131S1: SUBTEST
```

```
U 100D, 0018,0038,C580,09F0,0000,100E                    RC[0E]_K[.88]                    ; SET THE EXPECTED VIBA.
U 100E, 0000,003D,0180,0800,0000,116F           =0       ERLOOP
U 100F, 0000,003C,0180,0800,0000,1010                    NOP
U 1010, 2000,003D,0180,0A00,4200,1194           =0       ALU_R[0],FLUSH.IB,CALL[IBWAIT]   ; LOAD THE IB
U 1011, 3000,003C,0180,F800,0000,119C                    IBC/START,MCT/ALLOW.IB.READ      ; START THE IB AGAIN
U 119C, 0000,003C,0180,F800,0000,119D                    MCT/ALLOW.IB.READ                ; WAIT AND SEE IF ANOTHER REQ IS MADE
U 119D, 0000,003C,0180,F800,0000,119E                    MCT/ALLOW.IB.READ
U 119E, 1000,003C,0180,F800,0000,119F                    MCT/ALLOW.IB.READ,IBC/STOP
U 119F, 0810,0038,0180,0972,0000,11A0                    PC_VIBA,D_RC[0E]                 ; GET THE VIBA
U 11A0, 0014,0038,01C0,0800,0000,11A1                    Q_ALU,ALU_PC                     ; ...
U 11A1, 001D,A000,0180,0800,0010,11A2                    ALU_Q-D,CLK.UBCC,BYTE            ; CHECK IF ITS CORRECT
U 11A2, 0019,2134,49C0,0800,0000,1012                    Z?,Q_Q.AND.K[.FF]                ; BRANCH IF OK
U 1012, 0001,203D,0180,09E8,0000,1172           =0       ERROR2,RC[0D]_Q                  ; VIBA INCREMENTED
U 1013, 0000,003C,0180,0800,0000,1014                    NOP

                                                ;//////////////////////////////////////////////////////////////////////
                                                ;+
                                                ; CHECK THAT FLUSH INHIBITS THE IB REQUEST.
                                                ;-

                                                =0
U 1014, 0000,003D,0180,0800,0000,1189           T131S2:  SUBTEST
U 1015, 0000,003C,0180,0800,0000,1016                    NOP
U 1016, 0000,003D,0180,0800,0000,116F           =0       ERLOOP
U 1017, 2000,003C,0180,0A00,4200,11A3                    ALU_R[0],FLUSH.IB                ; LOAD THE VIBA
U 11A3, 3000,003C,0180,6000,0000,11A4                    LOAD.IB,IBC/START                ; START THE IB
U 11A4, 2000,003C,0180,F800,0000,11A5                    IBC/FLUSH,MCT/ALLOW.IB.READ
U 11A5, 2000,003C,0180,F800,0000,11A6                    IBC/FLUSH,MCT/ALLOW.IB.READ
U 11A6, 2000,003C,0180,F800,0000,11A7                    IBC/FLUSH,MCT/ALLOW.IB.READ
U 11A7, 2000,003C,0180,F800,0000,11A8                    IBC/FLUSH,MCT/ALLOW.IB.READ
U 11A8, 2000,003C,0180,F800,0000,11A9                    IBC/FLUSH,MCT/ALLOW.IB.READ
U 11A9, 1000,003C,0180,F800,0000,11AA                    IBC/STOP,MCT/ALLOW.IB.READ
U 11AA, 0000,003C,69F0,2C00,0000,11AB                    Q_ID[TIME.ADDR]                  ; READ THE PIBA
U 11AB, 0818,0038,4188,0800,0000,11AC                    Q_Q.LEFT2,D_K[.80]               ; THROW AWAY MSB'S AND GET EXPECTED DATA
U 11AC, 0000,003C,01A8,0800,0000,11AD                    Q_Q.LEFT
U 11AD, 0000,003C,01B0,0800,0000,11AE                    Q_Q.RIGHT                        ; AND ALIGN
U 11AE, 0019,2034,49C0,0800,0000,11AF                    Q_Q.AND.K[.FF]                   ; MASK
U 11AF, 001D,2000,0180,0800,0010,11B0                    ALU_Q-D,CLK.UBCC                 ; CHECK THE ADDRESS
U 11B0, 0001,013C,0180,09F0,0000,1018                    Z?,RC[0E]_D
U 1018, 0001,203D,0180,09E8,0000,1172           =0       ERROR2,RC[0D]_Q                  ; PIBA INCREMENTED

                                                ;+
                                                ; CHECK THAT BUFFER DID NOT GET ANY DATA
                                                ;-

U 1019, 0800,003C,0180,0A08,0000,11B1                    D_R[1]
U 11B1, 0001,003C,0180,09F0,0000,101A                    RC[0E]_D                         ; SET THE EXPECTED UPC BITS
U 101A, 0000,003D,0180,0800,0000,118E           =0       CALL[DISPAT]                     ; EXECUTE THE CALL 3
U 101B, 001D,2000,0180,0800,0010,11B2                    ALU_Q-D,CLK.UBCC                 ; CHECK THE ADDRESS
U 11B2, 0000,013C,0180,0800,0000,101C                    Z?
U 101C, 0001,203D,0180,09E8,0000,1172           =0       ERROR2,RC[0D]_Q                  ; BYTE ZERO IS NOT INVALID

                                                ;//////////////////////////////////////////////////////////////////////
                                                ;+
                                                ; CHECK THAT THE IB DOES NOT GET ANY DATA IF IT IS NOT RUNNING
```

```
                                        ;2419   ;-
                                        ;2420
U 101D, 0000,003C,0180,0800,0000,101E   ;2421   T131S3: NOP
U 101E, 0000,003D,0180,0800,0000,1189   ;2422   =0      SUBTEST
U 101F, 0000,003C,0180,0800,0000,1020   ;2423           NOP
U 1020, 0000,003D,0180,0800,0000,116F   ;2424   =0      ERLOOP
U 1021, 2000,003C,0180,F800,0000,11B3   ;2425           IBC/FLUSH,MCT/ALLOW.IB.READ     ; FLUSH THE IB
U 11B3, 0800,003C,0180,FA08,0000,11B4   ;2426           MCT/ALLOW.IB.READ,D_R[1]        ; SET EXPECTED DATA
U 11B4, 0001,003C,0180,F9F0,0000,11B5   ;2427           MCT/ALLOW.IB.READ,RC[0E]_D      ; ...
U 11B5, 0000,003C,0180,F800,0000,11B6   ;2428           MCT/ALLOW.IB.READ
U 11B6, 0000,003C,0180,F800,0000,11B7   ;2429           MCT/ALLOW.IB.READ
U 11B7, 0000,003C,0180,F800,0000,1022   ;2430           MCT/ALLOW.IB.READ
U 1022, 0000,003D,0180,0800,0000,118E   ;2431   =0      CALL[DISPAT]                    ; EXECUTE THE CALL 3
U 1023, 0810,0038,0180,0970,0000,11B8   ;2432           D_RC[0E]
U 11B8, 001D,2000,0180,0800,0010,11B9   ;2433           A[U_Q-D,CLK.UBCC                ; CHECK THE ADDRESS
U 11B9, 0000,013C,0180,0800,0000,1024   ;2434           Z?
U 1024, 0001,203D,0180,09E8,0000,1172   ;2435   =0      ERROR2,RC[0D]_Q                 ; BYTE 0 IS NOT INVALID
                                        ;2436
                                        ;2437   ;//////////////////////////////////////////'/////'/////////////////////////
                                        ;2438   ;+
                                        ;2439   ; CHECK THAT BDEST DOES NOT ENABLE "IB REQ"
                                        ;2440   ;-
                                        ;2441
U 1025, 0018,0038,C580,09F0,0000,1026   ;2442   T131S4: RC[0E]_K[.88]                   ; SET THE EXPECTED VIBA
U 1026, 0000,003D,0180,0800,0000,1189   ;2443   =0      SUBTEST
U 1027, 0000,003C,0180,0800,0000,1028   ;2444           NOP
U 1028, 0000,003D,0180,0800,0000,116F   ;2445   =0      ERLOOP
U 1029, 0000,003C,0180,0800,0000,102A   ;2446           NOP
U 102A, 2000,003D,0180,0A00,4200,1194   ;2447   =0      ALU_R[0],FLUSH.IB,CALL[IBWAIT]  ; LOAD THE IB
U 102B, 3000,003C,0180,0800,0000,11BA   ;2448           IBC7START                       ; START THE IB
U 11BA, 7000,003C,0180,F800,0000,11BB   ;2449           IBC/BDEST,MCT/ALLOW.IB.READ     ; EXECUTE THE FUNCTION
U 11BB, 7000,003C,0180,F800,0000,11BC   ;2450           IBC/BDEST,MCT/ALLOW.IB.READ     ; EXECUTE THE FUNCTION
U 11BC, 7000,003C,0180,F800,0000,11BD   ;2451           IBC/BDEST,MCT/ALLOW.IB.READ     ; EXECUTE THE FUNCTION
U 11BD, 1000,003C,0180,F800,0000,11BE   ;2452           IBC/STOP,MCT/ALLOW.IB.READ      ; STOP THE IB
U 11BE, 0810,0038,0180,0972,0000,11BF   ;2453           PC_VIBA,D_RC[0E]                ; GET THE VIBA
U 11BF, 0014,0038,01C0,0800,0000,11C0   ;2454           Q_ALU,ALU_PC                    ; ...
U 11C0, 001D,A000,0180,0800,0010,11C1   ;2455           A[U_Q-D,C[K.UBCC,BYTE           ; CHECK THE ADDRESS
U 11C1, 0019,2134,49C0,0800,0000,102C   ;2456           Z?,Q_Q.AND.K[.FF]               ; BRANCH IF OK
U 102C, 0001,203D,0180,09E8,0000,1172   ;2457   =0      ERROR2,RC[0D]_Q                 ; VIBA INCREMENTED
                                        ;2458
                                        ;2459   ;//////////////////////////////////////////////////////////////////////////
                                        ;2460   ;+
                                        ;2461   ; CHECK THAT CLR.O.1 CAUSES ANOTHER REQUEST TO BE MADE
                                        ;2462   ;-
                                        ;2463
U 102D, 0800,003C,0180,0A00,0000,11C2   ;2464   T131S5: D_R[0]
U 11C2, 0019,0014,0580,0A80,0000,102E   ;2465           R[0]_D+K[.1]                    ; SET THE IB ADDRESS = 401(X)
U 102E, 0000,003D,0180,0800,0000,1189   ;2466   =0      SUBTEST
U 102F, 0000,003C,0180,0800,0000,1030   ;2467           NOP
U 1030, 0818,0039,0180,0800,0000,1183   ;2468   =0      D_K[.8],CALL[DCF]               ; GENERATE UPC FOR "HALT" INSTR
U 1031, 0001,003C,0180,09F0,0000,1032   ;2469           RC[0E]_D                        ; SAVE
U 1032, 0000,003D,0180,0800,0000,116F   ;2470   =0      ERLOOP
U 1033, 0000,003C,0180,0800,0000,1034   ;2471           NOP
U 1034, 2000,003D,0180,0A00,4200,1194   ;2472   =0      ALU_R[0],FLUSH.IB,CALL[IBWAIT]  ; LOAD THE IB
U 1035, 3000,003C,0180,0800,0000,11C3   ;2473           IBC7START                       ; START THE IB AGAIN
```

```
U 11C3, 4000,003C,0180,F800,0000,11C4    ;2474         IBC/CLR.0.1,MCT/ALLOW.IB.READ   ; EXECUTE THE FUNCTION
U 11C4, 1000,003C,0180,F800,0000,11C5    ;2475         MCT/ALLOW.IB.READ,IBC/STOP      ; WAIT A CYCLE
U 11C5, E000,003C,0180,0800,0000,11C6    ;2476         IBC/CLR.0-3                     ; SHIFT BYTE 6 TO BYTE 0
U 11C6, 4000,003C,0180,0800,0000,1036    ;2477         IBC/CLR.0.1                     ; ...
U 1036, 0000,003D,0180,0800,0000,118E    ;2478   =0    CALL[DISPAT]                    ; EXECUTE CALL 3 ON BYTE 6
U 1037, 0810,0038,0180,0970,0000,11C7    ;2479         D_RC[OE]                        ; GET EXPECTED DATA
U 11C7, 001D,2000,0180,0800,0010,11C8    ;2480         ALU_Q-D,CLK.UBCC                ; CHECK THE ADDRESS
U 11C8, 0000,013C,0180,0800,0000,1038    ;2481         Z?
U 1038, 0001,203D,0180,09E8,0000,1172    ;2482   =0    ERROR2,RC[OD]_Q                 ; BYTE 7 DID NOT GET VALIDATED
                                         ;2483
                                         ;2484   ;////////////////////////////////////////////////////////////////
                                         ;2485   ;+
                                         ;2486   ; CHECK THAT THE VIBA INCREMENTS WHEN 4 BYTES ARE CLEARED
                                         ;2487   ;-
                                         ;2488
U 1039, 0800,003C,0180,0A00,0000,11C9    ;2489   T131S6: D_R[0]
U 11C9, 0019,0000,0580,0A80,0000,103A    ;2490         R[0]_D-K[.1]                    ; SET THE IB ADDRESS = 400(X)
U 103A, 0000,003D,0180,0800,0000,1189    ;2491   =0    SUBTEST
U 103B, 0818,0038,4180,0800,0000,103C    ;2492         D_K[.80]                        ; SET THE EXPECTED DATA
U 103C, 0019,0031,8580,09F0,0000,116F    ;2493   =0    ERLOOP,RC[OE]_D.OR.K[.C]
U 103D, 0000,003C,0180,0800,0000,103E    ;2494         NOP
U 103E, 2000,003D,0180,0A00,4200,1194    ;2495   =0    ALU_R[0],FLUSH.IB,CALL[IBWAIT]  ; LOAD THE IB
U 103F, 3000,003C,0180,0800,0000,11CA    ;2496         IBC7START                       ; START THE BUFFER AGAIN
U 11CA, E000,003C,0180,F800,0000,11CB    ;2497         IBC/CLR.0-3,MCT/ALLOW.IB.READ   ; SHOULD ASCERT REQUEST
U 11CB, 1000,003C,0180,F800,0000,11CC    ;2498         MCT/ALLOW.IB.READ,IBC/STOP      ; STOP THE IB
U 11CC, 0810,0038,0180,0972,0000,11CD    ;2499         PC_VIBA,D_RC[OE]                ; GET THE VIBA
U 11CD, 0014,0038,01C0,0800,0000,11CE    ;2500         Q_ALU,ALU_PC                    ; ...
U 11CE, 001D,A000,0180,0800,0010,11CF    ;2501         ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 11CF, 0019,2134,49C0,0800,0000,1040    ;2502         Z?,Q_Q.AND.K[.FF]
U 1040, 0001,203D,0180,09E8,0000,1172    ;2503   =0    ERROR2,RC[OD]_Q                 ; VIBA DID NOT INCREMENT
                                         ;2504
                                         ;2505   ;//////////////////////////////////////////////////////////////////
                                         ;2506   ;+
                                         ;2507   ; CHECK THAT SAVE INHIBITS AN IB REQUEST
                                         ;2508   ;-
                                         ;2509
U 1041, 0800,003C,0180,0A00,0000,11D0    ;2510   T131S7: D_R[0]
U 11D0, 0019,0014,1180,0A80,0000,1042    ;2511         R[0]_D+K[.4]                    ; SET THE IB ADDRESS = 404(X)
U 1042, 0000,003D,0180,0800,0000,1189    ;2512   =0    SUBTEST
U 1043, 0818,0038,4180,0800,0000,1044    ;2513         D_K[.80]                        ; SET THE EXPECTED VIBA
U 1044, 0019,0031,8580,09F0,0000,116F    ;2514   =0    ERLOOP,RC[OE]_D.OR.K[.C]
U 1045, 0000,003C,0180,0800,0000,1046    ;2515         NOP
U 1046, 2000,003D,0180,0A00,4200,1194    ;2516   =0    ALU_R[0],FLUSH.IB,CALL[IBWAIT]  ; LOAD THE IB
U 1047, 3000,003C,0180,0800,0000,11D1    ;2517         IBC7START                       ; START THE IB
U 11D1, F000,003C,0180,F800,0000,11D2    ;2518         IBC/CLR.1-5.COND,MCT/ALLOW.IB.READ ; EXECUTE THE FUNCTION
U 11D2, 0000,003C,0180,F800,0000,11D3    ;2519         MCT/ALLOW.IB.READ               ; WAIT A LITTLE
U 11D3, 0000,003C,0180,F800,0000,11D4    ;2520         MCT/ALLOW.IB.READ
U 11D4, 1000,003C,0180,F800,0000,11D5    ;2521         MCT/ALLOW.IB.READ,IBC/STOP      ; STOP THE IB
U 11D5, 0810,0038,0180,0972,0000,11D6    ;2522         PC_VIBA,D_RC[OE]                ; GET THE VIBA
U 11D6, 0014,0038,01C0,0800,0000,11D7    ;2523         Q_ALU,ALU_PC                    ; ...
U 11D7, 001D,A000,0180,0800,0010,11D8    ;2524         ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 11D8, 0019,2134,49C0,0800,0000,1048    ;2525         Z?,Q_Q.AND.K[.FF]
U 1048, 0001,203D,0180,09E8,0000,1172    ;2526   =0    ERROR2,RC[OD]_Q                 ; VIBA INCREMENTED
                                         ;2527
                                         ;2528   ;////////////////////////////////////////////////////////////////
```

```
                                        ;2529   ;+
                                        ;2530   ; CHECK THAT FLUSH INHIBITS THE VIBA COUNT
                                        ;2531   ;-
                                        ;2532
U 1049, 0818,0038,4180,0800,0000,104A   ;2533   T131S8: D_K[.80]                        ; SET THE EXPECTED DATA
U 104A, 0019,0031,1180,09F0,0000,1189   ;2534   =0      SUBTEST,RC[OE]_D.OR.K[.4]
U 104B, 0000,003C,0180,0800,0000,104C   ;2535           NOP
U 104C, 0000,003D,0180,0800,0000,116F   ;2536   =0      ERLOOP
U 104D, 2000,003C,0180,0A00,4200,11D9   ;2537           ALU_R[0],FLUSH.IB               ; LOAD THE VA AND VIBA
U 11D9, 3000,003C,0180,6000,0000,11DA   ;2538           LOAD.IB,IBC/START               ; START THE IB
U 11DA, 0000,003C,0180,F800,0000,11DB   ;2539           MCT/ALLOW.IB.READ               ; WAIT ONE CYCLE
U 11DB, 2000,003C,0180,F800,0000,11DC   ;2540           IBC/FLUSH,MCT/ALLOW.IB.READ     ; SHOULD BLOCK COUNT
U 11DC, 1000,003C,0180,0800,0000,11DD   ;2541           IBC/STOP                        ; STOP THE IB
U 11DD, 0810,0038,0180,0972,0000,11DE   ;2542           PC_VIBA,D_RC[OE]                ; GET THE VIBA
U 11DE, 0014,0038,01C0,0800,0000,11DF   ;2543           Q_ALU,ALU_PC                    ; ...
U 11DF, 001D,A000,0180,0800,0010,11E0   ;2544           ALU_Q-D,C[K.UBCC,BYTE           ; CHECK THE ADDRESS
U 11E0, 0019,2134,49C0,0800,0000,1050   ;2545           Z?,Q_Q.AND.K[.FF]
U 1050, 0001,203D,0180,09E8,0000,1172   ;2546   =0      ERROR2,RC[OD]_Q                 ; VIBA INCREMENTED
                                        ;2547
                                        ;2548   ;//////////////////////////////////////////////////////////////////////
                                        ;2549   ;+
                                        ;2550   ; CHECK THAT THE PC BEING NOT EVEN INHIBITS THE VIBA COUNT
                                        ;2551   ;-
                                        ;2552
U 1051, 0800,003C,0180,0A00,0000,11E1   ;2553   T131S9: D_R[0]
U 11E1, 0019,0000,0D80,0A80,0000,1052   ;2554           R[0]_D-K[.3]                    ; SET THE IB ADDRESS = 401(X)
U 1052, 0000,003D,0180,0800,0000,1189   ;2555   =0      SUBTEST
U 1053, 0018,0038,C580,09F0,0000,1054   ;2556           RC[OE]_K[.88]                   ; SET THE EXPECTED DATA
U 1054, 0000,003D,0180,0800,0000,116F   ;2557   =0      ERLOOP
U 1055, 0000,003C,0180,0800,0000,1056   ;2558           NOP
U 1056, 2000,003D,0180,0A00,4200,1194   ;2559   =0      ALU_R[0],FLUSH.IB,CALL[IBWAIT]  ; LOAD THE IB
U 1057, 3000,003C,0180,0800,0000,11E2   ;2560           IBC7START                       ; START THE IB AGAIN
U 11E2, D000,003C,0180,F800,0000,11E3   ;2561           IBC/CLR.1,MCT/ALLOW.IB.READ     ; MAKE BYTE 7 INVALID
U 11E3, 0000,003C,0180,F800,0000,11E4   ;2562           MCT/ALLOW.IB.READ               ; LET BUFFER GET MORE DATA
U 11E4, 0000,003C,0180,F800,0000,11E5   ;2563           MCT/ALLOW.IB.READ               ; LET BUFFER GET MORE DATA
U 11E5, 1000,003C,0180,F800,0000,11E6   ;2564           MCT/ALLOW.IB.READ,IBC/STOP      ; LET BUFFER GET MORE DATA
U 11E6, 0810,0038,0180,0972,0000,11E7   ;2565           PC_VIBA,D_RC[OE]                ; GET THE VIBA
U 11E7, 0014,0038,01C0,0800,0000,11E8   ;2566           Q_ALU,ALU_PC                    ; ...
U 11E8, 001D,A000,0180,0800,0010,11E9   ;2567           ALU_Q-D,C[K.UBCC,BYTE           ; CHECK THE ADDRESS
U 11E9, 0019,2134,49C0,0800,0000,1058   ;2568           Z?,Q_Q.AND.K[.FF]
U 1058, 0001,203D,0180,09E8,0000,1172   ;2569   =0      ERROR2,RC[OD]_Q                 ; VIBA INCREMENTED
U 1059, 0000,003C,0180,0800,0000,105C   ;2570           NOP
                                        ;2571
                                        ;2572   ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2573   ;% 80
                                        ;2574   ;$ CFCF,0000,0000,0000,0000,0000
                                        ;2575
```

```
                                         ;2576   .PAGE   "TEST 132       VAX MODE SPECIFIER 1 CONSTANT"
                                         ;2577   ;**********************************************************************
                                         ;2578   ;++
                                         ;2579   ; TEST  132     VAX MODE SPECIFIER 1 CONSTANT
                                         ;2580   ;
                                         ;2581   ; TEST DESCRIPTION
                                         ;2582   ;       THIS TEST CHECKS THAT THE FOUR POSSIBLE SP1 CONSTANTS ARE GENERATED
                                         ;2583   ;       IN THE DATA PATH CORRECTLY. IT LOADS THE IB WITH OPCODES OF BYTE,
                                         ;2584   ;       WORD, LONG, AND QUAD CONTEXT AND THEN READS THE SP1 CONSTANT INTO
                                         ;2585   ;       THE Q REGISTER AND CHECKS IT.
                                         ;2586   ;
                                         ;2587   ; LOGIC DESCRIPTION
                                         ;2588   ;       THIS TEST CHECKS THE CONTEXT LATCH ON THE IRC MODULE AND THE SP1
                                         ;2589   ;       INPUT TO THE KMX ON THE DCP MODULE.
                                         ;2590   ;
                                         ;2591   ; ERROR DESCRIPTION
                                         ;2592   ;       DATA: EXPECTED SP1 CONSTANT
                                         ;2593   ;             RECEIVED SP1 CONSTANT
                                         ;2594   ;             LOOP COUNT -- INDICATES WHICH CPCODE IS CURRENTLY IN THE IB.
                                         ;2595   ;               I.E., 4=BYTE, 3=WORD, 2=LONG, AND 1=QUAD
                                         ;2596   ;
                                         ;2597   ; SYNC POINT DESCRIPTION
                                         ;2598   ;       ADDRESS SYNC00--CONTEXT SHOULD LATCH ON THE IRC MODULE
                                         ;2599   ;       ADDRESS SYNC02--SP1 READ THRU THE KMX
                                         ;2600   ;--
                                         ;2601   ;*********************************************************************
                                         ;2602   =0
U 105C, 0018,0039,0D80,09F8,0000,115B    ;2603   T132:   NEWTST[.3]
U 105D, 0003,003C,0180,0A88,0000,11EA    ;2604           R[1]_0                          ; INIT ADDRESS OF IB DATA
U 11EA, 0018,0038,0580,09F0,0000,11EB    ;2605           RC[0E]_K[.1]                    ; INIT EXPECTED CONSTANT
                                         ;2606
                                         ;2607   ;/////////////////////////////////////////////////////////////////////
                                         ;2608   ;+
                                         ;2609   ; START THE TEST
                                         ;2610   ;-
                                         ;2611
U 11EB, 0018,0038,1180,09E0,0000,1060    ;2612   T132S1: RC[0C]_K[.4]                    ; SET THE LOOP COUNT
U 1060, 0000,003D,0180,0800,0000,116F    ;2613   =0      ERLOOP
U 1061, 0810,0038,0180,0970,0000,1062    ;2614   T132L1: D_RC[0E]                        ; GET EXP CONST
U 1062, 2000,003D,0180,0A08,4200,1194    ;2615   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1063, 0000,003C,0180,0800,0000,1064    ;2616           NOP
U 1064, 0000,003D,0180,0800,0000,118E    ;2617   =0      CALL,J/DISPAT                   ; LOAD THE SP1 LATCH
U 1065, 0018,0038,15C0,0800,0000,11EC    ;2618   SYNC02: Q_K(SP1)                        ; READ THE CONSTANT
U 11EC, 001D,A000,0180,0800,0010,11ED    ;2619           A[U_Q-D,CLK.UBCC,BYTE           ; CHECK
U 11ED, 0000,013C,0180,0800,0000,1066    ;2620           Z?                              ; BRANCH IF OK
U 1066, 0001,203D,0180,09E8,0000,1172    ;2621   =0      ERROR2,RC[0D]_Q
U 1067, 0000,003C,0180,0A08,0000,11EE    ;2622           LAB_R[1]
U 11EE, 0018,0014,0980,0A88,0000,11EF    ;2623           R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 11EF, 0810,0038,0180,0970,0000,11F0    ;2624           D_RC[0E]                        ; GEN NEW EXP DATA
U 11F0, 0500,003C,0180,0800,0000,11F1    ;2625           D_D.LEFT
U 11F1, 0001,003C,0180,09F0,0000,11F2    ;2626           RC[0E]_D
U 11F2, 0810,0038,0180,0960,0000,11F3    ;2627           D_RC[0C]                        ; GET THE LOOP COUNT
U 11F3, 0019,8000,0580,09E0,0010,11F4    ;2628           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT AND CHECK
U 11F4, 0000,013C,0180,0800,0000,1068    ;2629           Z?
U 1068, 0000,003C,0180,0800,0000,1061    ;2630   =0      J/T132L1
```

```
U 1069, 0000,003C,0180,0800,0000,106A   ;2631           NOP
                                        ;2632
                                        ;2633   ; THE FOLLOWING IS THE I BUFFER DATA FOR THE ABOVE TEST:
                                        ;2634   ;% 0
                                        ;2635   ;$ 0090,00B0,00D0,007D
                                        ;2636
                                        ;2637
                                        ;2638
```

```
                                           ;2639   .PAGE   "TEST 133       COMPATABILITY MODE SP1 AND SP2 CONSTANTS"
                                           ;2640   ;*********************************************************************
                                           ;2641   ;++
                                           ;2642   ; TEST  133     COMPATABILITY MODE SP1 AND SP2 CONSTANTS
                                           ;2643   ;
                                           ;2644   ; TEST DESCRIPTION
                                           ;2645   ;       THIS TEST USES 6 OPCODES TO CHECK THAT THE SP2 CONSTANT
                                           ;2646   ;       IS GENERATED CORRECTLY AND 4 OPCODES TO CHECK THAT TH SP1 CONSTANT
                                           ;2647   ;       IS GENERATED CORRECTLY.
                                           ;2648   ;       THE DATA TABLE AT THE END OF THE TEST DESCRIBES THE EXPECTED CONSTANT
                                           ;2649   ;       FOR EACH OF THE OPCODES.
                                           ;2650   ;
                                           ;2651   ;       SUBTST 1 - CHECK THE SP2 CONSTANT
                                           ;2652   ;       SUBTST 2 - CHECK THE SP1 CONSTANT
                                           ;2653   ;
                                           ;2654   ; LOGIC DESCRIPTION
                                           ;2655   ;       THIS TEST CHECKS THE LOGIC THAT GENERATES THE SP1 AND SP2 CONSTANTS
                                           ;2656   ;       ON THE IRC MODULE, AND THE SP2 CONSTANT INPUT TO THE KMX ON THE
                                           ;2657   ;       DCP MODULE.
                                           ;2658   ;
                                           ;2659   ; ERROR DESCRIPTION
                                           ;2660   ;       DATA: EXPECTED SPECIFIER CONSTANT
                                           ;2661   ;             RECEIVED SPECIFIER CONSTANT
                                           ;2662   ;             LOOP COUNT -- DESCRIBES WHICH OPCODE IS CURRENTLY IN THE IB.
                                           ;2663   ;
                                           ;2664   ; SYNC POINT DESCRIPTION
                                           ;2665   ;       SUBTST 1 - SYNC03--SP2 CONSTANT IS LOADED INTO THE Q REGISTER
                                           ;2666   ;       SUBTST 2 - SYNC04--SP1 CONSTANT IS LOADED INTO THE Q REGISTER
                                           ;2667   ;--
                                           ;2668   ;*********************************************************************
                                           ;2669   =0
U 106A, 0018,0039,0D80,09F8,0000,115B      ;2670   T133:   NEWTST[.3]
U 106B, 0018,0038,0580,09F0,0000,11F5      ;2671           RC[0E]_K[.1]                    ; INIT THE SP2 CONSTANT
                                           ;2672
                                           ;2673   ;/////////////////////////////////////////////////////////////////////
                                           ;2674   ;+
                                           ;2675   ; FIRST CHECK THE SP2 CONSTANT
                                           ;2676   ;-
                                           ;2677
U 11F5, 0018,0038,D580,09E0,0000,106C      ;2678   T133S1: RC[0C]_K[.6]                    ; SET THE LOOP COUNT
U 106C, 0000,003D,0180,0800,0000,1189      ;2679   =0      SUBTEST
U 106D, 0018,0038,0180,0A88,0000,106E      ;2680           R[1]_K[.8]                      ; SET ADR OF IB DATA
U 106E, 0000,003D,0180,0800,0000,116F      ;2681   =0      ERLOOP
U 106F, 0000,003C,0180,0800,0000,1070      ;2682   T133L1: NOP
U 1070, 2000,003D,0180,0A08,4200,1194      ;2683   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1071, 0000,003C,0180,0800,0000,1072      ;2684           NOP
U 1072, 0000,003D,0180,0800,0000,118F      ;2685   =0      CALL,J/SETCM                    ; SET THE CM BIT
U 1073, 0810,0038,0180,0970,0000,11F6      ;2686           D_RC[0E]
U 11F6, 0018,0038,19C0,0800,0000,11F7      ;2687   SYNC03: Q_K[SP2.CON]                    ; READ THE CONSTANT
U 11F7, 001D,2000,0180,0800,0010,11F8      ;2688           ALU_Q-D,CLK.UBCC                ; CHECK
U 11F8, 0000,013C,0180,0800,0000,1074      ;2689           Z?
U 1074, 0001,203D,0180,09E8,0000,1172      ;2690   =0      ERROR2,RC[0D]_Q                 ; SP2 CONSTANT FAILED
U 1075, 0000,003C,0180,0A08,0000,11F9      ;2691           LAB_R[1]
U 11F9, 0018,0014,0980,0A88,0000,11FA      ;2692           R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 11FA, 0810,0038,0180,0960,0000,11FB      ;2693           D_RC[0C]
```

```
U 11FB, 0019,8000,0D80,0800,0010,11FC   ;2694              ALU_D-K[.3],CLK.UBCC,BYTE       ; TIME TO CHANGE EXPEXTED DATA?
U 11FC, 0000,013C,0180,0800,0000,1076   ;2695              Z?                              ; BRANCH IF YES
U 1076, 0000,003C,0180,0800,0000,11FD   ;2696     =0       J/CMT7P1
U 1077, 0018,0038,0980,09F0,0000,11FD   ;2697              RC[0E]_K[.2]
U 11FD, 0019,8000,0580,09E0,0010,11FE   ;2698     CMT7P1: RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 11FE, 0000,013C,0180,0800,0000,1078   ;2699              Z?
U 1078, 0000,003C,0180,0800,0000,106F   ;2700     =0       J/T133L1
                                        ;2701
                                        ;2702
                                        ;2703     ;////////////////////////////////////////////////////////////////////
                                        ;2704     ;+
                                        ;2705     ; NOW CHECK THE SP1 CONSTANT
                                        ;2706     ;-
                                        ;2707
U 1079, 0018,0038,1180,09E0,0000,107A   ;2708     T133S2: RC[0C]_K[.4]                    ; SET THE LOOP COUNT
U 107A, 0000,003D,0180,0800,0000,1189   ;2709     =0       SUBTEST
U 107B, 0018,0038,0580,09F0,0000,107C   ;2710              RC[0E]_K[.1]                    ; INIT EXPECTED VALUE
U 107C, 0000,003D,0180,0800,0000,116F   ;2711     =0       ERLOOP
U 107D, 0000,003C,0180,0800,0000,107E   ;2712     T133L2: NOP
U 107E, 2000,003D,0180,0A08,4200,1194   ;2713     =0       ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 107F, 0000,003C,0180,0800,0000,1080   ;2714              NOP
U 1080, 0000,003D,0180,0800,0000,118F   ;2715     =0       CALL,J/SETCM                    ; SET THE CM BIT
U 1081, 0810,0038,0180,0970,0000,1082   ;2716              D_RC[0E]
U 1082, 0000,003D,0180,0800,0000,118E   ;2717     =0       CALL,J/DISPAT                   ; LATCH THE CONSTANT
U 1083, 0018,0038,15C0,0800,0000,11FF   ;2718     SYNC04: Q_K[SP1.CON]                    ; READ THE CONSTANT
U 11FF, 001D,2000,0180,0800,0010,1300   ;2719              ALU_Q-D,CLK.UBCC                ; CHECK
U 1300, 0000,013C,0180,0800,0000,1084   ;2720              Z?
U 1084, 0001,203D,0180,09E8,0000,1172   ;2721     =0       ERROR2,RC[0D]_Q                 ; SP2 CONSTANT FAILED
U 1085, 0000,003C,0180,0A08,0000,1301   ;2722              LAB_R[1]
U 1301, 0018,0014,0980,0A88,0000,1302   ;2723              R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 1302, 0810,0038,0180,0960,0000,1303   ;2724              D_RC[0C]
U 1303, 0019,8000,0D80,0800,0010,1304   ;2725              ALU_D-K[.3],CLK.UBCC,BYTE       ; TIME TO CHANGE EXPEXTED DATA?
U 1304, 0000,013C,0180,0800,0000,1086   ;2726              Z?                              ; BRANCH IF YES
U 1086, 0000,003C,0180,0800,0000,1305   ;2727     =0       J/CMT7P2
U 1087, 0018,0038,0980,09F0,0000,1305   ;2728              RC[0E]_K[.2]
U 1305, 0019,8000,0580,09E0,0010,1306   ;2729     CMT7P2: RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 1306, 0000,013C,0180,0800,0000,1088   ;2730              Z?
U 1088, 0000,003C,0180,0800,0000,107D   ;2731     =0       J/T133L2
U 1089, 0000,003C,0180,0800,0000,108A   ;2732              NOP
                                        ;2733
                                        ;2734
                                        ;2735     ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2736     ;% 8
                                        ;2737     ; SUBTEST 1, LOOP COUNT EQUALS 6 THRU 1
                                        ;2738     ;$ C514
                                        ;2739     ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                        ;2740     ; 142424
                                        ;2741     ;$ A412
                                        ;2742     ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                        ;2743     ; 122022
                                        ;2744     ;
                                        ;2745     ;$ 8CD4
                                        ;2746     ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                        ;2747     ; 106324
                                        ;2748     ;
```

```
;$ 8B12
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 105422
;
;$ C506
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 142406
;
;$ 4500
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 042400
;       OP CODES FOR SP1 CONSTANT
; SUBTEST 2, LOOP COUNT EQUALS 4 THRU 1
;$ C514
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 142424
;
;$ C494
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 142224
;
;$ C594
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 142604
;
;$ 4494
; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
; 042224
;
```

```
                                         .PAGE   "TEST 134       PC REGISTER INCREMENT BY 'N'"
                                         ;*********************************************************************
                                         ;++
                                         ; TEST  134      PC REGISTER INCREMENT BY 'N'
                                         ;
                                         ; TEST DESCRIPTION
                                         ;        THIS TEST CHECKS THAT CONSTANTS OF 2, 5, AND 3 ARE GENERATED BY THE
                                         ;        IB FOR THE PC INCREMENT CIRCUIT.
                                         ;        THE IB IS LOADED WITH THREE DIFFERENT SPECIFIERS, THE PC IS CLEARED
                                         ;        THE PC IS THEN INCREMENTED BY THE IB DISPLACEMENT AND READ INTO
                                         ;        THE Q REGISTER AND CHECKED.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;        THIS TEST CHECKS THAT THE SIGNALS "DELTA PC 0", "DELTA PC 1", AND
                                         ;        "DELTA PC 2", FROM THE IDP MODULE, CAN BE ADDED TO THE PC REGISTER
                                         ;        ON THE DCP MODULE.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;        DATA: EXPECTED VALUE OF THE PC REGISTER
                                         ;              RECEIVED VALUE OF THE PC REGISTER
                                         ;              LOOP COUNT - INDICATES THE EXPECTED PC INCREMENT VALUE
                                         ;                           I.E. 3 = 2, 2 = 5, AND 1 = 3
                                         ;
                                         ; SYNC POINT DESCRIPTION
                                         ;        ADDRESS SYNCFE--DELTA PC SIGNALS ARE ADDED TO PC
                                         ;--
                                         ;*********************************************************************
                                         =0
U 108A, 0018,0039,0D80,09F8,0000,115B    T134:   NEWTST[.3]
U 108B, 0818,0038,7580,0800,0000,1307            D_K[.20]
U 1307, 0019,0014,0980,0A80,0000,1308            R[0]_D+K[.2]                  ; SET ADR OF EXPECTED DATA
U 1308, 0019,0000,1180,0A88,0000,1309            R[1]_D-K[.4]                  ; SET ADR OF IB DATA

                                         ;/////////////////////////////////////////////////////////////////////
                                         ;+
                                         ; START THE TEST
                                         ;-

U 1309, 0018,0038,0D80,09E0,0000,130A    T134S1: RC[OC]_K[.3]                  ; SET THE LOOP COUNT
U 130A, 0000,003C,0180,0A00,0200,130B    T134L1: VA_R[0]
U 130B, 0000,803C,0180,C800,0000,130C            D[BYTE]_CACHE.P               ; FETCH EXP DATA
U 130C, 0803,803C,0180,0800,0000,130D            D_D.OXT[BYTE]
U 130D, 0001,003C,0180,09F0,0000,108C            RC[OE]_D                      ; SAVE
U 108C, 0000,003D,0180,0800,0000,116F    =0      ERLOOP
U 108D, 0000,003C,0180,0800,0000,108E            NOP
U 108E, 2000,003D,0180,0A08,4200,1194    =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 108F, 0018,0038,1980,0800,0200,130E            ALU_O(K),VA_ALU               ; LOAD THE VA
U 130E, 0810,0038,0180,0971,0000,130F            PC_VA,D_RC[OE]                ; LOAD THE PC
U 130F, 0000,003C,0180,0807,0000,1310    SYNCFE: PC_PC+N                       ; INCREMENT THE PC
U 1310, 0014,0038,01C0,0800,0000,1311            Q_PC                          ; READ THE PC
U 1311, 001D,2000,0180,0800,0010,1312            A[U_Q-D,CLK.UBCC              ; CHECK THE PC
U 1312, 0000,013C,0180,0800,0000,1090            Z?                            ; BRANCH IF OK
U 1090, 0001,203D,0180,09E8,0000,1172    =0      ERROR2,RC[OD]_Q
U 1091, 0000,003C,0180,0A08,0000,1313            LAB_R[1]
U 1313, 0018,0014,0980,0A88,0000,1314            R[1]_LA+K[.2]                 ; INCREMENT ADR OF IB DATA
```

```
U 1314, 0000,003C,0180,0A00,0000,1315   ;2835           LAB_R[0]
U 1315, 0018,0014,0580,0A80,0000,1316   ;2836           R[0]_LA+K[.1]                   ; INCREMENT ADR OF EXP DATA
U 1316, 0810,0038,0180,0960,0000,1317   ;2837           D_RC[0C]
U 1317, 0019,8000,0580,09E0,0010,1318   ;2838           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT THE LOOP COUNT
U 1318, 0000,013C,0180,0800,0000,1092   ;2839           Z?
U 1092, 0000,003C,0180,0800,0000,130A   ;2840   =0      J/T134L1
U 1093, 0000,003C,0180,0800,0000,1094   ;2841           NOP
                                        ;2842
                                        ;2843   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2844   ;% 1C
                                        ;2845   ;$ 9F90,8F90,C090
                                        ;2846   ;% 22
                                        ;2847   ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                        ;2848   ;$ 0205,0003
                                        ;2849
                                        ;2850
```

```
.PAGE   "TEST 135       INSTRUCTION DEPENDENT SCRATCH PAD ADDRESSING"
;*****************************************************************************
;++
; TEST  135     INSTRUCTION DEPENDENT SCRATCH PAD ADDRESSING
;
; TEST DESCRIPTION
;       THIS TEST CHECKS ALL THE POSSIBLE CONDITIONS THAT THE SCRATCH
;       PADS CAN BE ADDRESSED BY THE IB. EACH SUBTEST FLOATS A ONE THRU THE
;       SCRATCH PAD ADDRESS LINES BY LOADING SPECIFIERS INTO THE IB THAT HAVE
;       A REGISTER FIELD OF 0, 1, 2, 4, AND 8.
;       THE TEST STARTS BY LOADING ALL 16 OF THE RA AND RB SCRATCH PADS WITH
;       THE ADDRESS OF THEMSELVES. EACH SUBTEST THEN LOADS THE IB DATA,
;       LATCHES THE RA AND RB SCRATCH PADS, CHECKS LA, AND THEN CHECKS LB.
;
;       SUBTST 1 - RA AND RB ADDRESSED BY SPECIFIER 1
;       SUBTST 2 - RA AND RB ADDRESSED BY SPECIFIER 2
;       SUBTST 3 - RA AND RB ADDRESSED BY SPECIFIER 2 AND SPECIFIER 1 RESPECTIVELY.
;       SUBTST 4 - RA AND RB ADDRESSED BY THE PREVIOUS REGISTER NUMBER (PRN)
;       SUBTST 5 - RA AND RB ADDRESSED BY THE PRN PLUS 1. THIS SUBTEST
;                  CHECKS PRN'S OF 0, 1, 2, 4, 8, AND F TO ENSURE THAT
;                  THE ADDER IS WORKING CORRECTLY.
;       SUBTST 6 - RA AND RB ADDRESSED BY THE SP1 PLUS 1. THIS SUBTEST
;                  CHECKS SP1'S OF 0, 1, 2, 4, 8, AND F TO ENSURE THAT
;                  THE ADDER IS WORKING CORRECTLY.
;       SUBTST 7 - COMP MODE RA ADDRESSED BY SPECIFIER 1
;       SUBTST 8 - COMP MODE RA ADDRESSED BY SPECIFIER 2
;       SUBTST 9 - COMP MODE RA ADDRESSED BY PRN.OR.1. THIS SUBTEST
;                  CHECKS PRN'S OF 0, 1, 2, 4, 8, AND F TO ENSURE THAT
;                  COMP MODE DOES AN OR FUNCTION RATHER THAT AN ADD.
;
; LOGIC DESCRIPTION
;       THIS TEST CHECKS THE SPECIFIER 1 AND SPECIFIER 2 ADDRESS MULTIPLEXORS
;       IN VAX AND COMPATABILITY MODE, AND THE PRN LATCH
;       ON THE IDP MODULE, AND THE INSTRUCTION DEPENDENT INPUTS TO THE SCRATCH
;       PAD ADDRESS MULTIPLEXORS ON THE DAP MODULE.
;
; ERROR DESCRIPTION
;       DATA: EXPECTED SCRATCH PAD ADDRESS
;             RECEIVED SCRATCH PAD ADDRESS
;             LOOP COUNT -- DESCRIBES THE CONTENTS OF BYTES 1 AND 2 IN THE
;               INSTRUCTION BUFFER. (SEE THE DATA TABLE AT THE END OF THIS TEST)
;
; SYNC POINT DESCRIPTION
;       SUBTST 1 - SYNCFD--LA AND LB ARE LATCHED
;       SUBTST 2 - SYNC05--LA AND LB ARE LATCHED
;       SUBTST 3 - SYNC06--LA AND LB ARE LATCHED
;       SUBTST 4 - SYNC00--PRN IS LATCHED ON THE IDP MODULE
;                  SYNC07--LA AND LB ARE LATCHED
;       SUBTST 5 - SYNC08--LA AND LB ARE LATCHED
;       SUBTST 6 - SYNC12--LAB IS LATCHED
;       SUBTST 7 - SYNC09--LA IS LATCHED
;       SUBTST 8 - SYNC0A--LA IS LATCHED
;       SUBTST 9 - SYNC00--PRN IS LATCHED ON THE IDP MODULE
;                  SYNC13--LA IS LATCHED
;--
```

```
                                           ;*******************************************************************
                                           =0
U 1094, 0018,0039,0D80,09F8,0000,115B      T135:   NEWTST[.3]
U 1095, 0003,003C,0180,0A80,0000,1319              R[0]_0                          ; INIT THE SCRATCH PADS
U 1319, 0018,0038,0580,0A88,0000,131A              R[1]_K[.1]
U 131A, 0018,0038,0980,0A90,0000,131B              R[2]_K[.2]
U 131B, 0018,0038,0D80,0A98,0000,131C              R[3]_K[.3]
U 131C, 0818,0038,1180,0AA0,0000,131D              R[4]_K[.4],D_ALU
U 131D, 0019,0014,0580,0AA8,0000,131E              R[5]_D+K[.1]
U 131E, 0018,0038,D580,0AB0,0000,131F              R[6]_K[.6]
U 131F, 0018,0038,5D80,0AB8,0000,1320              R[7]_K[.7]
U 1320, 0018,0038,0180,0AC0,0000,1321              R[8]_K[.8]
U 1321, 0018,0038,D980,0AC8,0000,1322              R[9]_K[.9]
U 1322, 0818,0038,F580,0AD0,0000,1323              R[0A]_K[.A],D_ALU
U 1323, 0019,0014,0580,0AD8,0000,1324              R[0B]_D+K[.1]
U 1324, 0018,0038,8580,0AE0,0000,1325              R[0C]_K[.C]
U 1325, 0818,0038,8980,0AE8,0000,1326              R[0D]_K[.D],D_ALU
U 1326, 0019,0014,0580,0AF0,0000,1327              R[0E]_D+K[.1]
U 1327, 0018,0038,6180,0AF8,0000,1328              R[0F]_K[.F]
U 1328, 0818,0038,45F8,0800,0000,1329              D_K[.8000],Q_0                  ; INIT EXPECTED DATA
U 1329, 0000,003C,6580,0800,0084,732A              SC_K[.10]
U 132A, 0D00,003C,0180,0800,0000,132B              D_DAL.SC
U 132B, 0001,003C,0180,09F0,0000,132C              RC[0E]_D
U 132C, 0001,003C,0180,0990,0000,132D              RC[2]_D                         ; EQUALS 80000000
U 132D, 0018,0038,2D80,0988,0000,132E              RC[1]_K[.28]                    ; SET ADR OF IB DATA
U 132E, 0000,003C,1180,0800,0084,732F              SC_K[.4]                        ; GENERATE MASK FOR BITS<3:0>
U 132F, 0003,0010,01C0,0800,0000,1330              Q_MASK+1
U 1330, 0001,2028,0180,09C0,0000,1331              RC[8]_NOT.Q                     ; SAVE IN RC 8

                                           ;///////////////////////////////////////////////////////////////////
                                           ;+
                                           ; RA AND RB SELECTED BY SP1
                                           ;-

U 1331, 001B,0010,1180,09E0,0000,1096      T135S1: RC[0C]_0+K[.4]+1                ; SET THE LOOP COUNT
U 1096, 0000,003D,0180,0800,0000,1189      =0      SUBTEST
U 1097, 0000,003C,0180,0800,0000,1098              NOP
U 1098, 0000,003D,0180,0800,0000,116F      =0      ERLOOP
U 1099, 0810,0038,0180,0970,0000,109A      T135L1: D_RC[0E]                        ; GET EXPECTED DATA
U 109A, 2010,0039,0180,0908,4200,1194      =0      ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 109B, 0000,003C,0180,0840,0000,1332      SYNCFD: LAB_R(SP1)                      ; READ SP1 REGISTER
U 1332, 001C,A000,0180,0800,0010,1333              ALU_LA[A-B]D,CLK.UBCC,BYTE      ; CHECK THE REGISTER
U 1333, 0000,013C,0180,0800,0000,109C              Z?                              ; BRANCH IF OK
U 109C, 0000,003D,0180,09E8,0000,1172      =0      ERROR2,RC[0D]_LA
U 109D, 0810,0038,0180,0970,0000,1334              D_RC[0E]                        ; GET EXPECTED DATA
U 1334, 0000,003C,0180,0840,0000,1335              LAB_R(SP1)
U 1335, 000D,8000,0180,0800,0010,1336              ALU_D-LB,CLK.UBCC,BYTE          , CHECK THE LB REGISTER
U 1336, 0000,013C,0180,0800,0000,109E              Z?                              ; BRANCH IF OK
U 109E, 000C,0039,0180,09E8,0000,1172      =0      ERROR2,RC[0D]_LB

                                           ;+
                                           ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                           ;-

U 109F, 0810,0038,0180,0908,0000,1337              D_RC[1]
```

```
U 1337, 0019,0014,1180,0988,0000,1338   ;2961          RC[1]_D+K[.4]                    ; INCREMENT ADR OF IB DATA
U 1338, 0010,0038,01C0,0970,0000,1339   ;2962          Q_RC[0E]
U 1339, 0000,003C,00A8,0800,0000,133A   ;2963          Q_Q.LEFT,SI/ASHR                 ; GENERATE NEXT EXP DATA
U 133A, 0001,203C,0180,09F0,0000,133B   ;2964          RC[0E]_Q
U 133B, 0810,0038,0180,0960,0000,133C   ;2965          D_RC[0C]
U 133C, 0019,8000,0580,09E0,0010,133D   ;2966          RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT LOOP COUNT
U 133D, 0000,013C,0180,0800,0000,10A0   ;2967          Z?
U 10A0, 0000,003C,0180,0800,0000,1099   ;2968   =0     J/T135L1
                                        ;2969
                                        ;2970   ;//////////////////////////////////////////////////////////////////////
                                        ;2971   ;+
                                        ;2972   ; RA AND RB SELECTED BY SP2
                                        ;2973   ;-
                                        ;2974
U 10A1, 0018,0038,0580,09F0,0000,10A2   ;2975   T135S2: RC[0E]_K[.1]                    ; INIT EXPECTED DATA
U 10A2, 0000,003D,0180,0800,0000,1189   ;2976   =0     SUBTEST
U 10A3, 0018,0038,2D80,0988,0000,133E   ;2977          RC[1]_K[.28]                     ; INIT ADR OF IB DATA
U 133E, 0818,0038,1180,0800,0000,133F   ;2978          D_K[.4]
U 133F, 0019,0014,0580,09E0,0000,10A4   ;2979          RC[0C]_D+K[.1]                   ; SET THE LOOP COUNT
U 10A4, 0000,003D,0180,0800,0000,116F   ;2980   =0     ERLOOP
U 10A5, 0810,0038,0180,0970,0000,10A6   ;2981   T135L2: D_RC[0E]                        ; GET EXP DATA
U 10A6, 2010,0039,0180,0908,4200,1194   ;2982   =0     A[U_RC[1],FLUSH.IB,CALL,J/IBWAIT ;LOAD THE IB
U 10A7, 0000,003C,01C0,0848,0000,1340   ;2983   SYNC05: LAB_R(SP2),Q_LA                 ; READ THE SELECTED REGISTER
U 1340, 0000,003C,0180,0940,0000,1341   ;2984          LC_RC[8]
U 1341, 0011,2034,01C0,0800,0000,1342   ;2985          Q_Q.AND.LC                       ; MASK BITS <3:0>
U 1342, 001D,A000,0180,0800,0010,1343   ;2986          A[U_Q-D,CLK.UBCC,BYTE            ; CHECK THE REGISTER
U 1343, 0000,013C,0180,0800,0000,10A8   ;2987          Z?                               ; BRANCH IF OK
U 10A8, 0001,203D,0180,09E8,0000,1172   ;2988   =0     ERROR2,RC[0D]_Q
                                        ;2989
                                        ;2990   ;+
                                        ;2991   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;2992   ;-
                                        ;2993
U 10A9, 0810,0038,0180,0970,0000,1344   ;2994          D_RC[0E]                         ; GET EXPECTED DATA
U 1344, 000C,0038,01C0,0848,0000,1345   ;2995          LAB_R(SP2),Q_LB                  ; READ THE SELECTED REGISTER
U 1345, 0000,003C,0180,0940,0000,1346   ;2996          LC_RC[8]
U 1346, 0011,2034,01C0,0800,0000,1347   ;2997          Q_Q.AND.LC                       ; MASK BITS <3:0>
U 1347, 001D,A000,0180,0800,0010,1348   ;2998          A[U_Q-D,CLK.UBCC,BYTE            ; CHECK THE REGISTER
U 1348, 0000,013C,0180,0800,0000,10AA   ;2999          Z?                               ; BRANCH IF OK
U 10AA, 0001,203D,0180,09E8,0000,1172   ;3000   =0     ERROR2,RC[0D]_Q
U 10AB, 0810,0038,0180,0908,0000,1349   ;3001          D_RC[1]
U 1349, 0019,0014,1180,0988,0000,134A   ;3002          RC[1]_D+K[.4]                    ; INCREMENT ADR OF IB DATA
U 134A, 0010,0038,01C0,0970,0000,134B   ;3003          Q_RC[0E]
U 134B, 0000,003C,00A8,0940,0000,134C   ;3004          Q_Q.LEFT,SI/ASHR,LC_RC[8]        ; GENERATE NEXT EXP DATA
U 134C, 0011,2034,01C0,0800,0000,134D   ;3005          Q_Q.AND.LC                       ; MASK THE EXPECTED DATA
U 134D, 0001,203C,0180,09F0,0000,134E   ;3006          RC[0E]_Q
U 134E, 0810,0038,0180,0960,0000,134F   ;3007          D_RC[0C]
U 134F, 0019,8000,0580,09E0,0010,1350   ;3008          RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT LOOP COUNT
U 1350, 0000,013C,0180,0800,0000,10AC   ;3009          Z?
U 10AC, 0000,003C,0180,0800,0000,10A5   ;3010   =0     J/T135L2
                                        ;3011
                                        ;3012
                                        ;3013   ;//////////////////////////////////////////////////////////////////////
                                        ;3014   ;+
                                        ;3015   ; RA SELECTED BY SP2 AND RB SELECTED BY SP1
```

```
                                         ;3016   ;-
                                         ;3017
U 10AD, 0810,0038,0180,0910,0000,1351    ;3018   T135S3: D_RC[2]                         ; INIT EXP DATA
U 1351, 0001,003C,0180,09F0,0000,10AE    ;3019           RC[0E]_D
U 10AE, 0000,003D,0180,0800,0000,1189    ;3020   =0      SUBTEST
U 10AF, 0018,0038,2D80,0988,0000,1352    ;3021           RC[1]_K[.28]                    ; INIT ADR OF IB DATA
U 1352, 0818,0038,1180,0800,0000,1353    ;3022           D_K[.4]
U 1353, 0019,0014,0580,09E0,0000,10B0    ;3023           RC[0C]_D+K[.1]                  ; INIT LOOP COUNT
U 10B0, 0000,003D,0180,0800,0000,116F    ;3024   =0      ERLOOP
U 10B1, 0810,0038,0180,0970,0000,10B2    ;3025   T135L3: D_RC[0E]                        ; GET EXP DATA
U 10B2, 2010,0039,0180,0908,4200,1194    ;3026   =0      A[U_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10B3, 000C,0038,01C0,0850,0000,1354    ;3027   SYNC06: LAB_R(SP2.SP1),Q_LB             ;READ THE REGISTERS
U 1354, 0000,003C,0180,0940,0000,1355    ;3028           LC_RC[8]
U 1355, 0011,2034,01C0,0800,0000,1356    ;3029           Q_Q.AND.LC                      ; MASK BITS <3:0>
U 1356, 001D,A000,0180,0800,0010,1357    ;3030           A[U_Q-D,CLK.UBCC,BYTE           ; CHECK THE REGISTER
U 1357, 0000,013C,0180,0800,0000,10B4    ;3031           Z?                              ; BRANCH IF OK
U 10B4, 0001,203D,0180,09E8,0000,1172    ;3032   =0      ERROR2,RC[0D]_Q
U 10B5, 0010,0038,01C0,0970,0000,1358    ;3033           Q_RC[0E]
U 1358, 0000,003C,00A8,0940,0000,1359    ;3034           Q_Q.LEFT,SI/ASHR,LC_RC[8]       ; GET EXP DATA
U 1359, 0011,2034,01C0,0800,0000,135A    ;3035           Q_Q.AND.LC                      ; MASK THE EXPECTED DATA
U 135A, 0001,203C,0180,09F0,0000,10B6    ;3036           RC[0E]_Q
U 10B6, 0000,003D,0180,0800,0000,116F    ;3037   =0      ERLOOP
U 10B7, 0810,0038,0180,0970,0000,135B    ;3038           D_RC[0E]                        ; GET EXP DATA
U 135B, 0000,003C,01C0,0850,0000,135C    ;3039           LAB_R(SP2.SP1),Q_LA             ;READ THE REGISTERS
U 135C, 0000,003C,0180,0940,0000,135D    ;3040           LC_RC[8]
U 135D, 0011,2034,01C0,0800,0000,135E    ;3041           Q_Q.AND.LC                      ; MASK BITS <3:0>
U 135E, 001D,A000,0180,0800,0010,135F    ;3042           A[U_Q-D,CLK.UBCC,BYTE           ; CHECK THE REGISTER
U 135F, 0000,013C,0180,0800,0000,10B8    ;3043           Z?                              ; BRANCH IF OK
U 10B8, 0001,203D,0180,09E8,0000,1172    ;3044   =0      ERROR2,RC[0D]_Q
                                         ;3045
                                         ;3046   ;+
                                         ;3047   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                         ;3048   ;-
                                         ;3049
U 10B9, 0810,0038,0180,0908,0000,1360    ;3050           D_RC[1]
U 1360, 0019,0014,1180,0988,0000,1361    ;3051           RC[1]_D+K[.4]                   ; INCREMENT ADR OF IB DATA
U 1361, 0810,0038,0180,0960,0000,1362    ;3052           D_RC[0C]
U 1362, 0019,8000,0580,09E0,0010,1363    ;3053           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 1363, 0000,013C,0180,0800,0000,10BA    ;3054           Z?
U 10BA, 0000,003C,0180,0800,0000,10B1    ;3055   =0      J/T135L3
                                         ;3056
                                         ;3057
                                         ;3058   ;//////////////////////////////////////////////////////////////////////////
                                         ;3059   ;+
                                         ;3060   ; RA AND RB SELECTED BY PRN
                                         ;3061   ;-
                                         ;3062
U 10BB, 0810,0038,0180,0910,0000,1364    ;3063   T135S4: D_RC[2]
U 1364, 0001,003C,0180,09F0,0000,10BC    ;3064           RC[0E]_D                        ; INIT EXPECTED DATA
U 10BC, 0000,003D,0180,0800,0000,1189    ;3065   =0      SUBTEST
U 10BD, 0018,0038,2D80,0988,0000,1365    ;3066           RC[1]_K[.28]                    ; INIT ADR OF IB DATA
U 1365, 0818,0038,1180,0800,0000,1366    ;3067           D_K[.4]
U 1366, 0019,0014,0580,09E0,0000,10BE    ;3068           RC[0C]_D+K[.1]                  ; INIT LOOP COUNT
                                         ;3069
U 10BE, 0000,003D,0180,0800,0000,116F    ;3070   =0      ERLOOP
```

```
U 10BF, 0810,0038,0180,0970,0000,10C0    ;3071    T135L4: D_RC[0E]                          ; GET EXPECTED DATA
U 10C0, 2010,0039,0180,0908,4200,1194    ;3072    =0      A[U_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10C1, 0000,003C,0180,0800,0000,10C2    ;3073            NOP
U 10C2, 0000,003D,0180,0800,0000,118E    ;3074    =0      CALL,J/DISPAT                     ; LOAD PRN
U 10C3, D000,003C,0180,0800,0000,1367    ;3075            IBC/CLR.1                         ; CHANGE INPUT TO PRN LATCH
U 1367, 0000,003C,0180,0858,0000,1368    ;3076    SYNC07: LAB_R(PRN)                        ; READ PRN REGISTER
U 1368, 001C,A000,0180,0800,0010,1369    ;3077            ALU_LA[A-B]D,CLK.UBCC,BYTE        ; CHECK THE REGISTER
U 1369, 0000,013C,0180,0800,0000,10C4    ;3078            Z?                                ; BRANCH IF OK
U 10C4, 0000,003D,0180,09E8,0000,1172    ;3079    =0      ERROR2,RC[0D]_LA
U 10C5, 0810,0038,0180,0970,0000,136A    ;3080            D_RC[0E]                          ; GET EXPECTED DATA
U 136A, 0000,003C,0180,0858,0000,136B    ;3081            LAB_R(PRN)
U 136B, 000D,8000,0180,0800,0010,136C    ;3082            ALU_D-LB,CLK.UBCC,BYTE            ; CHECK THE LB REGISTER
U 136C, 0000,013C,0180,0800,0000,10C6    ;3083            Z?                                ; BRANCH IF OK
U 10C6, 000C,0039,0180,09E8,0000,1172    ;3084    =0      ERROR2,RC[0D]_LB
                                         ;3085
                                         ;3086    ;+
                                         ;3087    ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                         ;3088    ;-
                                         ;3089
U 10C7, 0810,0038,0180,0908,0000,136D    ;3090            D_RC[1]
U 136D, 0019,0014,1180,0988,0000,136E    ;3091            RC[1]_D+K[.4]                     ; INCREMENT ADR OF IB DATA
U 136E, 0010,0038,01C0,0970,0000,136F    ;3092            Q_RC[0E]
U 136F, 0000,003C,00A8,0800,0000,1370    ;3093            Q_Q.LEFT,SI/ASHR                  ; GENERATE NEXT EXP DATA
U 1370, 0001,203C,0180,09F0,0000,1371    ;3094            RC[0E]_Q
U 1371, 0810,0038,0180,0960,0000,1372    ;3095            D_RC[0C]
U 1372, 0019,8000,0580,09E0,0010,1373    ;3096            RC[0C]_D-K[.1],CLK.UBCC,BYTE      ; DECREMENT LOOP COUNT
U 1373, 0000,013C,0180,0800,0000,10C8    ;3097            Z?
U 10C8, 0000,003C,0180,0800,0000,10BF    ;3098    =0      J/T135L4
                                         ;3099
                                         ;3100
                                         ;3101    ;//////////////////////////////////////////////////////////////////////
                                         ;3102    ;+
                                         ;3103    ; RA AND RB SELECTED BY PRN+1
                                         ;3104    ;-
                                         ;3105
U 10C9, 0810,0038,0180,0910,0000,1374    ;3106    T135S5: D_RC[2]
U 1374, 0001,003C,0180,09F0,0000,1375    ;3107            RC[0E]_D
U 1375, 0001,003C,0180,0998,0000,10CA    ;3108            RC[3]_D
U 10CA, 0000,003D,0180,0800,0000,1189    ;3109    =0      SUBTEST
U 10CB, 0018,0038,2D80,0988,0000,1376    ;3110            RC[1]_K[.28]                      ; INIT ADR OF IB DATA
U 1376, 0018,0038,D580,09E0,0000,1377    ;3111            RC[0C]_K[.6]
                                         ;3112
U 1377, 0010,0038,01C0,0918,0000,1378    ;3113    T135L6: Q_RC[3]                           ; GEN EXP DATA
U 1378, 0019,2014,05C0,0940,0000,1379    ;3114            Q_Q+K[.1],LC_RC[8]                ; ...
U 1379, 0011,2034,01C0,0800,0000,137A    ;3115            Q_Q.AND.LC                        ; MASK THE DATA
U 137A, 0001,203C,0180,09F0,0000,10CC    ;3116            RC[0E]_Q                          ; SAVE
U 10CC, 0000,003D,0180,0800,0000,116F    ;3117    =0      ERLOOP
U 10CD, 0810,0038,0180,0970,0000,10CE    ;3118            D_RC[0E]
U 10CE, 2010,0039,0180,0908,4200,1194    ;3119    =0      A[U_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10CF, 0000,003C,0180,0800,0000,10D0    ;3120            NOP
U 10D0, 0000,003D,0180,0800,0000,118E    ;3121    =0      CALL,J/DISPAT
U 10D1, D000,003C,0180,0800,0000,137B    ;3122            IBC/CLR.1
U 137B, 0000,003C,01C0,0860,0000,137C    ;3123    SYNC08: LAB_R(PRN+1),Q_LA                 ; READ THE REGISTERS
U 137C, 0000,003C,0180,0940,0000,137D    ;3124            LC_RC[8]
U 137D, 0011,2034,01C0,0800,0000,137E    ;3125            Q_Q.AND.LC                        ; MASK BITS <3:0>
```

```
U 137E, 001D,A000,0180,0800,0010,137F   ;3126            ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE REGISTER
U 137F, 0000,013C,0180,0800,0000,10D2   ;3127            Z?
U 10D2, 0001,203D,0180,09E8,0000,1172   ;3128   =0       ERROR2,RC[0D]_Q
U 10D3, 000C,0038,01C0,0860,0000,1380   ;3129            LAB_R(PRN+1),Q_LB               ; READ THE REGISTERS
U 1380, 0000,003C,0180,0940,0000,1381   ;3130            LC_RC[8]
U 1381, 0011,2034,01C0,0800,0000,1382   ;3131            Q_Q.AND.LC                      ; MASK BITS <3:0>
U 1382, 0810,0038,0180,0970,0000,1383   ;3132            D_RC[0E]
U 1383, 001D,A000,0180,0800,0010,1384   ;3133            ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE REGISTER
U 1384, 0000,013C,0180,0800,0000,10D4   ;3134            Z?                              ; BRANCH IF OK
U 10D4, 0001,203D,0180,09E8,0000,1172   ;3135   =0       ERROR2,RC[0D]_Q
                                        ;3136
                                        ;3137   ;+
                                        ;3138   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3139   ;-
                                        ;3140
U 10D5, 0810,0038,0180,0908,0000,1385   ;3141            D_RC[1]
U 1385, 0019,0014,1180,0988,0000,1386   ;3142            RC[1]_D+K[.4]                   ; INCREMENT ADR OF IB DATA
U 1386, 0010,0038,01C0,0918,0000,1387   ;3143            Q_RC[3]
U 1387, 0000,003C,00A8,0800,0000,1388   ;3144            Q_Q.LEFT,SI/ASHR                ; GEN. NEXT EXP DATA
U 1388, 0001,203C,0180,0998,0000,1389   ;3145            RC[3]_Q
U 1389, 0810,0038,0180,0960,0000,138A   ;3146            D_RC[0C]
U 138A, 0019,8000,0980,0800,0010,138B   ;3147            ALU_D-K[.2],CLK.UBCC,BYTE       ; SEE IF LOOP COUNT IS 2
U 138B, 0000,013C,0180,0800,0000,10D6   ;3148            Z?                              ; BRANCH IF YES
U 10D6, 0000,003C,0180,0800,0000,138C   ;3149   =0       J/T15P1                         ; CONTINUE
U 10D7, 0018,0038,6180,0998,0000,138C   ;3150            RC[3]_K[.F]                     ; CHANGE EXP DATA
U 138C, 0019,8000,0580,09E0,0010,138D   ;3151   T15P1:   RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 138D, 0000,013C,0180,0800,0000,10D8   ;3152            Z?
U 10D8, 0000,003C,0180,0800,0000,1377   ;3153   =0       J/T135L6
                                        ;3154
                                        ;3155   ;////////////////////////////////////////////////////////////////
                                        ;3156   ;+
                                        ;3157   ; RA AND RB SELECTED BY SP1+1
                                        ;3158   ;-
                                        ;3159
U 10D9, 0810,0038,0180,0910,0000,138E   ;3160   T135S6:  D_RC[2]
U 138E, 0001,003C,0180,09F0,0000,138F   ;3161            RC[0E]_D
U 138F, 0001,003C,0180,0998,0000,10DA   ;3162            RC[3]_D
U 10DA, 0000,003D,0180,0800,0000,1189   ;3163   =0       SUBTEST
U 10DB, 0018,0038,2D80,0988,0000,1390   ;3164            RC[1]_K[.28]                    ; INIT ADR OF IB DATA
U 1390, 0018,0038,D580,09E0,0000,1391   ;3165            RC[0C]_K[.6]
                                        ;3166
U 1391, 0010,0038,01C0,0918,0000,1392   ;3167   T135L9:  Q_RC[3]                         ; GEN EXP DATA
U 1392, 0019,2014,05C0,0940,0000,1393   ;3168            Q_Q+K[.1],LC_RC[8]              ; ...
U 1393, 0011,2034,01C0,0800,0000,1394   ;3169            Q_Q.AND.LC                      ; MASK THE DATA
U 1394, 0001,203C,0180,09F0,0000,10DC   ;3170            RC[0E]_Q                        ; SAVE
U 10DC, 0000,003D,0180,0800,0000,116F   ;3171   =0       ERLOOP
U 10DD, 0810,0038,0180,0970,0000,10DE   ;3172            D_RC[0E]
U 10DE, 2010,0039,0180,0908,4200,1194   ;3173   =0       ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10DF, 0000,003C,01C0,0870,0000,1395   ;3174   SYNC12:  LAB_R(SP1+1),Q_LA               ; READ THE REGISTERS
U 1395, 0000,003C,0180,0940,0000,1396   ;3175            LC_RC[8]
U 1396, 0011,2034,01C0,0800,0000,1397   ;3176            Q_Q.AND.LC                      ; MASK BITS <3:0>
U 1397, 001D,A000,0180,0800,0010,1398   ;3177            ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE REGISTER
U 1398, 0000,013C,0180,0800,0000,10E0   ;3178            Z?
U 10E0, 0001,203D,0180,09E8,0000,1172   ;3179   =0       ERROR2,RC[0D]_Q
U 10E1, 000C,0038,01C0,0870,0000,1399   ;3180            LAB_R(SP1+1),Q_LB               ; READ THE REGISTERS
```

```
U 1399, 0000,003C,0180,0940,0000,139A    ;3181           LC_RC[8]
U 139A, 0011,2034,01C0,0800,0000,139B    ;3182           Q_Q.AND.LC                      ; MASK BITS <3:0>
U 139B, 0810,0038,0180,0970,0000,139C    ;3183           D_RC[0E]
U 139C, 001D,A000,0180,0800,0010,139D    ;3184           A[U_Q-D,CLK.UBCC,BYTE           ; CHECK THE REGISTER
U 139D, 0000,013C,0180,0800,0000,10E2    ;3185           Z?                              ; BRANCH IF OK
U 10E2, 0001,203D,0180,09E8,0000,1172    ;3186   =0      ERROR2,RC[0D]_Q
                                         ;3187
                                         ;3188   ;+
                                         ;3189   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                         ;3190   ;-
                                         ;3191
U 10E3, 0810,0038,0180,0908,0000,139E    ;3192           D_RC[1]
U 139E, 0019,0014,1180,0988,0000,139F    ;3193           RC[1]_D+K[.4]                   ; INCREMENT ADR OF IB DATA
U 139F, 0010,0038,01C0,0918,0000,13A0    ;3194           Q_RC[3]
U 13A0, 0000,003C,00A8,0800,0000,13A1    ;3195           Q_Q.LEFT,SI/ASHR                ; GEN NEXT EXP DATA
U 13A1, 0001,203C,0180,0998,0000,13A2    ;3196           RC[3]_Q
U 13A2, 0810,0038,0180,0960,0000,13A3    ;3197           D_RC[0C]
U 13A3, 0019,8000,0980,0800,0010,13A4    ;3198           A[U_D-K[.2],CLK.UBCC,BYTE       ; SEE IF LOOP COUNT IS 2
U 13A4, 0000,013C,0180,0800,0000,10E4    ;3199           Z?                              ; BRANCH IF YES
U 10E4, 0000,003C,0180,0800,0000,13A5    ;3200   =0      J/T15P2                         ; CONTINUE
U 10E5, 0018,0038,6180,0998,0000,13A5    ;3201           RC[3]_K[.F]                     ; CHANGE EXP DATA
U 13A5, 0019,8000,0580,09E0,0010,13A6    ;3202   T15P2:  RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 13A6, 0000,013C,0180,0800,0000,10E6    ;3203           Z?
U 10E6, 0000,003C,0180,0800,0000,1391    ;3204   =0      J/T135L9
                                         ;3205
                                         ;3206   ;//////////////////////////////////////////////////////////////////////
                                         ;3207   ;+
                                         ;3208   ; NOW CHECK COMPATABILITY MODE SP1 ADDRESS
                                         ;3209   ;-
                                         ;3210
U 10E7, 0018,0038,0580,09F0,0000,10E8    ;3211   T135S7: RC[0E]_K[.1]                    ; INIT EXPECTED DATA
U 10E8, 0000,003D,0180,0800,0000,1189    ;3212   =0      SUBTEST
U 10E9, 0018,0038,0D80,09E0,0000,10EA    ;3213           RC[0C]_K[.3]                    ; SET THE LOOP COUNT
U 10EA, 0000,003D,0180,0800,0000,116F    ;3214   =0      ERLOOP
U 10EB, 0000,003C,0180,0800,0000,10EC    ;3215   T135L7: NOP
U 10EC, 2010,0039,0180,0908,4200,1194    ;3216   =0      ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD TEH IB
U 10ED, 0000,003C,0180,0800,0000,10EE    ;3217           NOP
U 10EE, 0000,003D,0180,0800,0000,118F    ;3218   =0      CALL,J/SETCM                    ; SET THE CM BIT
U 10EF, 0810,0038,0180,0970,0000,13A7    ;3219           D_RC[0E]                        ; GET EXPECTED REGISTER ADDRESS
U 13A7, 0000,003C,0180,0840,0000,13A8    ;3220   SYNC09: LAB_R(SP1)                      ; READ THE SELECTED REGISTER
U 13A8, 001C,A000,0180,0800,0010,13A9    ;3221           ALU_LA[A-B]D,CLK.UBCC,BYTE      ; CHECK
U 13A9, 0000,013C,0180,0800,0000,10F0    ;3222           Z?
U 10F0, 0000,003D,0180,09E8,0000,1172    ;3223   =0      ERROR2,RC[0D]_LA                        ; SP1 FAILED
                                         ;3224
                                         ;3225   ;+
                                         ;3226   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                         ;3227   ;-
                                         ;3228
U 10F1, 0810,0038,0180,0908,0000,13AA    ;3229           D_RC[1]
U 13AA, 0019,0014,0980,0988,0000,13AB    ;3230           RC[1]_D+K[.2]                   ; INCREMENT ADR OF IB DATA
U 13AB, 0010,0038,01C0,0970,0000,13AC    ;3231           Q_RC[0E]
U 13AC, 0000,003C,00A8,0800,0000,13AD    ;3232           Q_Q.LEFT,SI/ASHR                ; GEN NEXT EXPECTED REGISTER
U 13AD, 0001,203C,0180,09F0,0000,13AE    ;3233           RC[0E]_Q
U 13AE, 0810,0038,0180,0960,0000,13AF    ;3234           D_RC[0C]
U 13AF, 0019,8000,0580,09E0,0010,13B0    ;3235           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
```

```
U 13B0, 0000,013C,0180,0800,0000,10F2   ;3236           Z?
U 10F2, 0000,003C,0180,0800,0000,10EB   ;3237   =0      J/T135L7
                                        ;3238
                                        ;3239   ;//////////////////////////////////////////////////////////////////
                                        ;3240   ;+
                                        ;3241   ; NOW CHECK THE SP2 REGISTER SELECT
                                        ;3242   ;-
                                        ;3243
U 10F3, 0018,0038,0580,09F0,0000,10F4   ;3244   T135S8: RC[0E]_K[.1]                    ; INIT EXPECTED DATA
U 10F4, 0000,003D,0180,0800,0000,1189   ;3245   =0      SUBTEST
U 10F5, 0018,0038,0D80,09E0,0000,10F6   ;3246           RC[0C]_K[.3]                    ; SET THE LOOP COUNT
U 10F6, 0000,003D,0180,0800,0000,116F   ;3247   =0      ERLOOP
U 10F7, 0000,003C,0180,0800,0000,10F8   ;3248   T135L8: NOP
U 10F8, 2010,0039,0180,0908,4200,1194   ;3249   =0      ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10F9, 0000,003C,0180,0800,0000,10FA   ;3250           NOP
U 10FA, 0000,003D,0180,0800,0000,118F   ;3251   =0      CALL,J/SETCM                    ; SET CM MODE
U 10FB, 0810,0038,0180,0970,0000,13B1   ;3252           D_RC[0E]
U 13B1, 0000,003C,0180,0848,0000,13B2   ;3253   SYNC0A: LAB_R(SP2)                      ; READ THE SELECTED SCRATCH PAD
U 13B2, 001C,A000,0180,0800,0010,13B3   ;3254           ALU_LA[A-B]D,CLK.UBCC,BYTE      ; CHECK THE REGISTER
U 13B3, 0000,013C,0180,0800,0000,10FC   ;3255           Z?
U 10FC, 0000,003D,0180,09E8,0000,1172   ;3256   =0      ERROR2,RC[0D]_LA                        ; SP2 FAILED
                                        ;3257
                                        ;3258   ;+
                                        ;3259   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3260   ;-
                                        ;3261
U 10FD, 0810,0038,0180,0908,0000,13B4   ;3262           D_RC[1]
U 13B4, 0019,0014,0980,0988,0000,13B5   ;3263           RC[1]_D+K[.2]                   ; INCREMENT ADR OF IB DATA
U 13B5, 0010,0038,01C0,0970,0000,13B6   ;3264           Q_RC[0E]
U 13B6, 0000,003C,00A8,0800,0000,13B7   ;3265           Q_Q.LEFT,SI/ASHR                ; GEN NEXT EXPECTED REGISTER
U 13B7, 0001,203C,0180,09F0,0000,13B8   ;3266           RC[0E]_Q
U 13B8, 0810,0038,0180,0960,0000,13B9   ;3267           D_RC[0C]
U 13B9, 0019,8000,0580,09E0,0010,13BA   ;3268           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT THE LOP COUNT
U 13BA, 0000,013C,0180,0800,0000,10FE   ;3269           Z?
U 10FE, 0000,003C,0180,0800,0000,10F7   ;3270   =0      J/T135L8
                                        ;3271
                                        ;3272   ;//////////////////////////////////////////////////////////////////
                                        ;3273   ;+
                                        ;3274   ; NOW CHECK COMPATABILITY MODF PRN .OR. 1 ADDRESS
                                        ;3275   ;-
                                        ;3276
U 10FF, 0018,0038,0580,09F0,0000,13BB   ;3277   T135S9: RC[0E]_K[.1]                    ; INIT EXPECTED DATA
U 13BB, 0018,0038,0580,0980,0000,110A   ;3278           RC[0]_K[.1]                     ; SET SEED TO CALCULATE NEXT EXP DATA
U 110A, 0000,003D,0180,0800,0000,1189   ;3279   =0      SUBTEST
U 110B, 0018,0038,0D80,09E0,0000,13BC   ;3280           RC[0C]_K[.3]                    ; SET THE LOOP COUNT
U 13BC, 0018,0038,3180,0988,0000,1110   ;3281           RC[1]_K[.40]                    ; SET IB ADDRESS
U 1110, 0000,003D,0180,0800,0000,116F   ;3282   =0      ERLOOP
U 1111, 0000,003C,0180,0800,0000,1112   ;3283   T135L10:NOP
U 1112, 2010,0039,0180,0908,4200,1194   ;3284   =0      ALU_RC[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD TEH IB
U 1113, 0000,003C,0180,0800,0000,1114   ;3285           NOP
U 1114, 0000,003D,0180,0800,0000,118E   ;3286   =0      CALL,J/DISPAT                   ; LATCH THE PRN
U 1115, 0000,003C,0180,0800,0000,1116   ;3287           NOP
U 1116, 0000,003D,0180,0800,0000,118F   ;3288   =0      CALL,J/SETCM                    ; SET THE CM BIT
U 1117, 0810,0038,0180,0970,0000,13BD   ;3289           D_RC[0E]                        ; GET EXPECTED REGISTER ADDRESS
U 13BD, 0000,003C,0180,0860,0000,13BE   ;3290   SYNC13: LAB_R(SRC!1)                    ; READ THE SELECTED REGISTER
```

```
U 13BE, 001C,A000,0180,0800,0010,13BF                  ALU_LA[A-B]D,CLK.UBCC,BYTE      ; CHECK
U 13BF, 0000,013C,0180,0800,0000,1118                  Z?
U 1118, 0000,003D,0180,09E8,0000,1172          =0      ERROR2,RC[0D]_LA                          ; SP1 FAILED

                                               ;+
                                               ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                               ;-

U 1119, 0810,0038,0180,0908,0000,13C0                  D_RC[1]
U 13C0, 0019,0014,0980,0988,0000,13C1                  RC[1]_D+K[.2]                   ; INCREMENT ADR OF IB DATA
U 13C1, 0010,0038,01C0,0900,0000,13C2                  Q_RC[0]
U 13C2, 0000,003C,00A8,0800,0000,13C3                  Q_Q.LEFT,SI/ASHR                ; GEN NEXT EXPECTED REGISTER
U 13C3, 0001,203C,0180,0980,0000,13C4                  RC[0]_Q
U 13C4, 0019,2030,05C0,0800,0000,13C5                  Q_Q.OR.K[.1]
U 13C5, 0001,203C,0180,09F0,0000,13C6                  RC[0E]_Q
U 13C6, 0810,0038,0180,0960,0000,13C7                  D_RC[0C]
U 13C7, 0019,8000,0580,09E0,0010,13C8                  RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
U 13C8, 0000,013C,0180,0800,0000,111A                  Z?
U 111A, 0000,003C,0180,0800,0000,1111          =0      J/T135L10
U 111B, 0000,003C,0180,0800,0000,111C                  NOP


                                               ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                               ;% 28
                                               ; SUBTESTS 1,2,3, AND 4 HAVE LOOP COUNTS FROM 5 THRU 1
                                               ; SUBTEST 5 AND 6 HAS A LOOP COUNT FROM 6 THRU 1
                                               ; THE FOLLOWING LOOP COUNT DESCRIPTIONS REFER TO SUBTEST 1,2,3, AND 4.
                                               ; IF SUBTEST 5 OR 6 FAILS, ADD ONE TO THE LOOP COUNT SHOWN HERE.
                                               ; LOOP COUNT = 5
                                               ;$ 0090,0001
                                               ; LOOP COUNT = 4
                                               ;$ 0190,0002
                                               ; LOOP COUNT = 3
                                               ;$ 0290,0004
                                               ; LOOP COUNT = 2
                                               ;$ 0490,0008
                                               ; LOOP COUNT = 1
                                               ;$ 0890,0000
                                               ; LOOP COUNT = 1, SUBTEST 5 AND 6 ONLY
                                               ;$ 0F90,0000
                                               ;
                                               ; OPCODES FOR SUBTEST 7 AND 9, LOOP COUNTS FROM 3 THRU 1
                                               ;% 40
                                               ;$ 1E48,1E88,1F08
                                               ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                               ; 017110,017210,017410
                                               ; OPCODES FOR SUBTEST 8, LOOP COUNTS FROM 3 TO 1
                                               ;$ 1C79,1C7A,1C7C
                                               ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                               ; 016171,016172,016174
```

```
                                            .PAGE   "TEST 136       BMUX GETS PC OR LB FUNCTION"
                                            ;*************************************************************************
                                            ;++
                                            ; TEST  136     BMUX GETS PC OR LB FUNCTION
                                            ;
                                            ; TEST DESCRIPTION
                                            ;       THIS TEST CHECKS THAT WHEN THE SPECIFIER 1 REGISTER IS THE PC
                                            ;       THAT THE BMUX GATES THE PC THRU AND WHEN IT'S NOT THE PC, THE
                                            ;       BMUX GATES THE LB THRU, WHEN EXECUTING THE BMX FUNCTION OF
                                            ;       "PC.OR.LB".
                                            ;
                                            ; LOGIC DESCRIPTION
                                            ;       THIS TEST CHECKS THE SIGNAL "PC REG" ON THE IRC MODULE AND THE
                                            ;       BMUX SELECT LOGIC ON THE DAP MODULE.
                                            ;
                                            ; ERROR DESCRIPTION
                                            ;       DATA: EXPECTED DATA
                                            ;             RECEIVED DATA
                                            ;             LOOP COUNT - INDICATES WHEN THE SP1 IS EQUAL TO THE PC
                                            ;                          I.E. 2 = PC, 1 = NOT PC
                                            ;               NOTE: THE PC IS SETUP TO CONTAIN -1 AND THE LB TO CONTAIN
                                            ;                     ZERO SO THE RECEIVED DATA WILL SHOW WHICH REGISTER
                                            ;                     WAS SELECTED, AND THE EXPECTED DATA SHOWS WHICH REGISTER
                                            ;                     WAS SUPPOSE TO BE SELECTED.
                                            ;
                                            ; SYNC POINT DESCRIPTION
                                            ;       ADDRESS SYNC0B--BMUX SELECT IS ACTIVE
                                            ;--
                                            ;************************************************************************
                                            =0
U 111C, 0018,0039,0D80,09F8,0000,115B       T136:   NEWTST[.3]
U 111D, 0018,0038,3580,0A88,0000,13C9               R[1]_K[.50]                     ; INIT ADR OF IB DATA 50(16)
U 13C9, 0003,0028,0180,09F0,0200,13CA               ALU_-1,RC[0E]_ALU,VA_ALU        ; INIT EXPECTED DATA
U 13CA, 0003,003C,0180,0A90,0000,13CB               R[2]_0

                                            ;////////////////////////////////////////////////////////////////////////
                                            ;+
                                            ; START THE TEST
                                            ;-

U 13CB, 0018,0038,0980,09E0,0000,111E       T136S1: RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 111E, 0000,003D,0180,0800,0000,116F       =0      ERLOOP
U 111F, 0810,0038,0180,0970,0000,1120       T136L1: D_RC[0E]                        ; GET EXPECTED DATA
U 1120, 2000,003D,0180,0A08,4200,1194       =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1121, 0003,0028,0180,0800,0200,13CC               ALU_-1,VA_ALU
U 13CC, 0000,003C,0180,0801,0000,13CD               PC_VA
U 13CD, 0000,003C,0180,0A10,0000,13CE               LAB_R[2]                        ; PUT KNOWN DATA IN LB
U 13CE, 0004,0038,01C0,0800,0000,13CF       SYNC0B: BMX7PC.OR.LB,ALU/B,Q_ALU        ; READ THE BMX
U 13CF, 001D,2000,0180,0800,0010,13D0               ALU_Q-D,CLK.UBCC                ; SELECT OK?
U 13D0, 0000,013C,0180,0800,0000,1122               Z?                              ; BRANCH IF OK
U 1122, 0001,203D,0180,09E8,0000,1172       =0      ERROR2,RC[0D]_Q
U 1123, 0000,003C,0180,0A08,0000,13D1               LAB_R[1]
U 13D1, 0018,0014,0980,0A88,0000,13D2               R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 13D2, 0003,003C,0180,09F0,0000,13D3               RC[0E]_0                        ; SET EXP DATA
U 13D3, 0810,0038,0180,0960,0000,13D4               D_RC[0C]
```

```
U 13D4, 0019,8000,0580,09E0,0010,13D5   ;3399           RC[OC]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT LOOP COUNT
U 13D5, 0000,013C,0180,0800,0000,1124   ;3400           Z?
U 1124, 0000,003C,0180,0800,0000,111F   ;3401   =0      J/T136L1
U 1125, 0000,003C,0180,0800,0000,1126   ;3402           NOP
                                        ;3403
                                        ;3404   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;3405   ;% 50
                                        ;3406   ;$ 0F90,0090
                                        ;3407
                                        ;3408
                                        .PAGE   "TEST 137       SHIFTER SELECT ON INSTRUCTION DEPENDENT DATA TYPE"
                                        ;*********************************************************************
                                        ;++
                                        ; TEST  137     SHIFTER SELECT ON INSTRUCTION DEPENDENT DATA TYPE
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST CHECKS THAT THE SHIFTER IS SELECTED FOR THE CORRECT
                                        ;       SHIFT FOR INSTRUCTION DEPENDENT DATA TYPES OF BYTE, WORD, LONG,
                                        ;       AND QUAD. THIS IS DONE BY LOADING THE IB WITH THE SPECIFIC OPCODE
                                        ;       FOR THE DATA TYPE, PUTTING A 1 THRU THE ALU AND SELECTING THE SHIFTER
                                        ;       FOR DATA TYPE DEPENDENT, AND LOADING THE RESULT INTO THE Q REGISTER
                                        ;       AND CHECKING IT.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS THE SHIFTER SELECT LOGIC FOR INSTRUCTION
                                        ;       DEPENDENT DATA TYPE ON THE DAP MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED SHIFTER OUTPUT
                                        ;             RECEIVED SHIFTER OUTPUT
                                        ;             LOOP COUNT -- INDICATES THE DATA TYPE CURRENTLY BEING TEST,
                                        ;               I.E. 4=QUAD, 3=LONG, 2=WORD, AND 1=BYTE.
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       ADDRESS SYNCOC--DATA IS GATED THRU THE SHIFTER
                                        ;--
                                        ;*********************************************************************
                                        =0
U 1126, 0018,0039,0D80,09F8,0000,115B   T137:   NEWTST[.3]
U 1127, 0818,0038,3580,0800,0000,13D6           D_K[.50]
U 13D6, 0019,0014,1180,0A88,0000,13D7           R[1]_D+K[.4]                    ; INIT ADR OF IB DATA
U 13D7, 0018,0038,0180,09F0,0000,13D8           RC[OE]_K[.8]                    ; INIT EXP DATA
U 13D8, 0018,0038,0580,0A80,0000,13D9           R[0]_K[.1]                      ; INIT DATA TO SHIFT

                                        ;/////////////////////////////////////////////////////////////////////
                                        ;+
                                        ; START THE TEST
                                        ;-

U 13D9, 0018,0038,1180,09E0,0000,1128   T137S1: RC[OC]_K[.4]                    ; SET THE LOOP COUNT
U 1128, 0000,003D,0180,0800,0000,116F   =0      ERLOOP
U 1129, 0000,003C,0180,0800,0000,112A           NOP
                                        =0
U 112A, 2000,003D,0180,0A08,4200,1194   T137L1: ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 112B, 0810,0038,0180,0970,0000,112C           D_RC[OE]                        ; GET EXPECTED DATA
U 112C, 0000,003D,0180,0800,0000,118E   =0      CALL,J/DISPAT                   ; LOAD THE CONSTANT LATCH
U 112D, 0060,C03C,01C0,0A00,0000,13DA   SYNCOC: ALU_R[0],SHF/ALU.DT,DT/INST.DEP,QK/SHF ; EXECUTE THE SHIFT
U 13DA, 001D,2000,0180,0800,0010,13DB           ALU_Q-D,CLK.UBCC                ; CHECK THE SHIFTED DATA
U 13DB, 0000,013C,0180,0800,0000,112E           Z?                              ; BRANCH IF OK
U 112E, 0001,203D,0180,09E8,0000,1172   =0      ERROR2,RC[OD]_Q
U 112F, 0000,003C,0180,0A08,0000,13DC           LAB_R[1]
U 13DC, 0018,0014,0980,0A88,0000,13DD           R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 13DD, 0810,0038,0180,0970,0000,13DE           D_RC[OE]
U 13DE, 0600,003C,0180,0800,0000,13DF           D_D.RIGHT
U 13DF, 0001,003C,0180,09F0,0000,13E0           RC[OE]_D                        ; GEN NEW EXP DATA
```

```
U 13E0, 0810,0038,0180,0960,0000,13E1   ;3464           D_RC[OC]
U 13E1, 0019,8000,0580,09E0,0010,13E2   ;3465           RC[OC]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 13E2, 0000,013C,0180,0800,0000,1130   ;3466           Z?
U 1130, 0000,003C,0180,0800,0000,112A   ;3467   =0      J/T137L1
U 1131, 0000,003C,0180,0800,0000,1132   ;3468           NOP
                                        ;3469
                                        ;3470   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;3471   ;% 54
                                        ;3472   ;$ 507D,50D0,50B0,5090
                                        ;3473
                                        ;3474
                                        .PAGE   "TEST 138       COMPATABILITY MODE CONTEXT LATCH"
                                        ;*************************************************************************
                                        ;++
                                        ; TEST  138     COMPATABILITY MODE CONTEXT LATCH
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST CHECKS BYTE AND WORD CONTEXT BY LOADING THE IB WITH
                                        ;       THE APPROPRIATE OPCODE, DOING A SIGN EXTEND THRU THE AMX WITH
                                        ;       INSTRUCTION DEPENDENT DATA TYPE, AND CHECKING THAT THE CONTEXT
                                        ;       WAS RECEIVED CORRECTLY BY CHECKING THE SIGN EXTENDED DATA.
                                        ;
                                        ;       SUBTST 1 - CHECK BYTE CONTEXT
                                        ;       SUBTST 2 - CHECK WORD CONTEXT
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS THE CONTEXT MULTIPLEXOR OF THE IRC MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED SIGN EXTENDED DATA
                                        ;             RECEIVED SIGN EXTENDED DATA
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       ADDRESS SYNC00--CONTEXT IS LATCHED AT THE INSTRUCTION AFTER
                                        ;                       THIS ONE.
                                        ;--
                                        ;**********************************************************************
                                        =0
U 1132, 0018,0039,0980,09F8,0000,115B   T138:   NEWTST[.2]
U 1133, 0018,0038,A580,0A88,0000,13E3           R[1]_K[.60]                     ; SET ADR OF IB DATA
U 13E3, 0018,0038,4D80,0A80,0000,1134           R[0]_K[.FF00]                   ; INIT AMX DATA

                                        ;//////////////////////////////////////////////////////////////////////
                                        ;+
                                        ; FIRST CHECK BYTE CONTEXT
                                        ;-

                                        =0
U 1134, 0000,003D,0180,0800,0000,1189   T138S1: SUBTEST
U 1135, 0003,003C,0180,09F0,0000,1136           RC[0E]_0                        ; INIT EXPECTED AMUX DATA
U 1136, 0000,003D,0180,0800,0000,116F   =0      ERLOOP
U 1137, 0000,003C,0180,0800,0000,1138           NOP
U 1138, 2000,003D,0180,0A08,4200,1194   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1139, 0000,003C,0180,0800,0000,113A           NOP
U 113A, 0000,003D,0180,0800,0000,118F   =0      CALL,J/SETCM                    ; SET THE CM BIT
U 113B, 0F00,003C,0180,0800,0000,113C           D_0
U 113C, 0000,003D,0180,0800,0000,118E   =0      CALL,J/DISPAT                   ; LATCH THE CONTEXT
U 113D, 0000,003C,01C0,0A00,0000,13E4           Q_R[0]                          ; PUT AMX DATA IN Q
U 13E4, 0002,E03C,01C0,0800,0000,13E5           Q_Q.SXT[INST.DEP]               ; CHECK THE CONTEXT
U 13E5, 001D,2000,0180,0800,0010,13E6           ALU_Q-D,CLK.UBCC                ; CHECK RESULT
U 13E6, 0000,013C,0180,0800,0000,113E           Z?
U 113E, 0001,203D,0180,09E8,0000,1170   =0      ERROR1,RC[0D]_Q                 ; CONTEXT INCORRECT


                                        ;//////////////////////////////////////////////////////////////////////
                                        ;+
                                                 ;3530   ; NOW CHECK WORD CONTEXT
                                                 ;3531   ;-
                                                 ;3532
U 113F, 0000,003C,0180,0A08,0000,1140            ;3533   T138S2: LAB_R[1]
U 1140, 0000,003D,0180,0800,0000,1189            ;3534   =0      SUBTEST
U 1141, 0018,0014,0980,0A88,0000,13E7            ;3535           R[1]_LA+K[.2]                     ; INCREMENT ADR OF IB DATA
U 13E7, 0818,0038,C180,0800,0000,13E8            ;3536           D_K[.FFFF]                        ; GEN AMX DATA
U 13E8, 0B00,003C,0180,0800,0000,13E9            ;3537           D_D.SWAP
U 13E9, 0001,003C,0180,0A80,0000,1142            ;3538           R[0]_D                            ; SAVE
U 1142, 0000,003D,0180,0800,0000,116F            ;3539   =0      ERLOOP
U 1143, 0000,003C,0180,0800,0000,1144            ;3540           NOP
U 1144, 2000,003D,0180,0A08,4200,1194            ;3541   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1145, 0000,003C,0180,0800,0000,1146            ;3542           NOP
U 1146, 0000,003D,0180,0800,0000,118F            ;3543   =0      CALL,J/SETCM                      ; SET THE CM BIT
U 1147, 0F00,003C,0180,0800,0000,1148            ;3544           D_0
U 1148, 0000,003D,0180,0800,0000,118E            ;3545   =0      CALL,J/DISPAT                     ; LATCH THE CONTEXT
U 1149, 0000,003C,01C0,0A00,0000,13EA            ;3546           Q_R[0]                            ; PUT AMX DATA IN Q
U 13EA, 0002,E03C,01C0,0800,0000,13EB            ;3547           Q_Q.SXT[INST.DEP]                 ; CHECK THE CONTEXT
U 13EB, 001D,2000,0180,0800,0010,13EC            ;3548           ALU_Q-D,CLK.UBCC                  ; CHECK RESULT
U 13EC, 0000,013C,0180,0800,0000,114A            ;3549           Z?
U 114A, 0001,203D,0180,09E8,0000,1170            ;3550   =0      ERROR1,RC[OD]_Q                   ; CONTEXT INCORRECT
U 114B, 0000,003C,0180,0800,0000,114C            ;3551           NOP
                                                 ;3552
                                                 ;3553
                                                 ;3554   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                                 ;3555   ;% 60
                                                 ;3556   ; SUBTEST 1
                                                 ;3557   ;$ C514
                                                 ;3558   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                                 ;3559   ; 142424
                                                 ;3560   ;
                                                 ;3561   ; SUBTEST 2
                                                 ;3562   ;$ 4500
                                                 ;3563   ; EQUIVALENT OCTAL DATA FOR THE ABOVE HEX DATA:
                                                 ;3564   ; 042400
                                                 ;3565
                                                 ;3566   =0
U 114C, 0000,003D,0180,0800,0000,115B            ;3567   T139:   NEWTST
U 114D, 0000,003C,0180,0800,0000,114E            ;3568           NOP
                                                 ;3569   =0
U 114E, 0000,003D,0180,0800,0000,115B            ;3570   T13A:   NEWTST
U 114F, 0000,003C,0180,0800,0000,1150            ;3571           NOP
                                                 ;3572   =0
U 1150, 0000,003D,0180,0800,0000,115B            ;3573   T13B:   NEWTST
U 1151, 0000,003C,0180,0800,0000,1152            ;3574           NOP
                                                 ;3575   =0
U 1152, 0000,003D,0180,0800,0000,115B            ;3576   T13C:   NEWTST
U 1153, 0000,003C,0180,0800,0000,13ED            ;3577           NOP
U 13ED, 0000,003D,0180,0800,0000,115B            ;3578   ENDTST: NEWTST
                                                 ;3579
```

```
;                           Location / Line Number Index

;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - OFFF Unused
U 1000           1876:    1845     1847=    1866=    1867=    1868=    1884=    1885=
U 1008           2351=    2352=    2353=    2354=    2363=    2364=    2365=    2366=
U 1010           2367=    2368=    2376=    2377=    2385=    2386=    2387=    2388=
U 1018           2403=    2409=    2411=    2412=    2414=    2421=    2422=    2423=
U 1020           2424=    2425=    2431=    2432=    2435=    2442=    2443=    2444=
U 1028           2445=    2446=    2447=    2448=    2457=    2464=    2466=    2467=
U 1030           2468=    2469=    2470=    2471=    2472=    2473=    2478=    2479=
U 1038           2482=    2489=    2491=    2492=    2493=    2494=    2495=    2496=
U 1040           2503=    2510=    2512=    2513=    2514=    2515=    2516=    2517=
U 1048           2526=    2533=    2534=    2535=    2536=    2537=    1920:    1846
U 1050           2546=    2553=    2555=    2556=    2557=    2558=    2559=    2560=
U 1058           2569=    2570=    1924:    1869     2603=    2604=    1928:    1870
U 1060           2613=    2614=    2615=    2616=    2617=    2618=    2621=    2622=
U 1068           2630=    2631=    2670=    2671=    2679=    2680=    2681=    2682=
U 1070           2683=    2684=    2685=    2686=    2690=    2691=    2696=    2697=
U 1078           2700=    2708=    2709=    2710=    2711=    2712=    2713=    2714=
U 1080           2715=    2716=    2717=    2718=    2721=    2722=    2727=    2728=
U 1088           2731=    2732=    2808=    2809=    2823=    2824=    2825=    2826=
U 1090           2832=    2833=    2840=    2841=    2908=    2909=    2941=    2942=
U 1098           2943=    2944=    2945=    2946=    2949=    2950=    2954=    2960=
U 10A0           2968=    2975=    2976=    2977=    2980=    2981=    2982=    2983=
U 10A8           2988=    2994=    3000=    3001=    3010=    3018=    3020=    3021=
U 10B0           3024=    3025=    3026=    3027=    3032=    3033=    3037=    3038=
U 10B8           3044=    3050=    3055=    3063=    3065=    3066=    3070=    3071=
U 10C0           3072=    3073=    3074=    3075=    3079=    3080=    3084=    3090=
U 10C8           3098=    3106=    3109=    3110=    3117=    3118=    3119=    3120=
U 10D0           3121=    3122=    3128=    3129=    3135=    3141=    3149=    3150=
U 10D8           3153=    3160=    3163=    3164=    3171=    3172=    3173=    3174=
U 10E0           3179=    3180=    3186=    3192=    3200=    3201=    3204=    3211=
U 10E8           3212=    3213=    3214=    3215=    3216=    3217=    3218=    3219=
U 10F0           3223=    3229=    3237=    3244=    3245=    3246=    3247=    3248=
U 10F8           3249=    3250=    3251=    3252=    3256=    3262=    3270=    3277=
U 1100           1831:    1832:    1833:    1834:    1835:    1836:    1837:    1838:
U 1108           1839:    1871     3279=    3280=    1840:    1841:    1842:    1843:
U 1110           3282=    3283=    3284=    3285=    3286=    3287=    3288=    3289=
U 1118           3293=    3299=    3309=    3310=    3374=    3375=    3385=    3386=
U 1120           3387=    3388=    3394=    3395=    3401=    3402=    3437=    3438=
U 1128           3449=    3450=    3452=    3453=    3454=    3455=    3458=    3459=
U 1130           3467=    3468=    3502=    3503=    3512=    3513=    3514=    3515=
U 1138           3516=    3517=    3518=    3519=    3520=    3521=    3525=    3533=
U 1140           3534=    3535=    3539=    3540=    3541=    3542=    3543=    3544=
U 1148           3545=    3546=    3550=    3551=    3567=    3568=    3570=    3571=
U 1150           3573=    3574=    3576=    3577=    1872     2012:    1873     1874
U 1158           1875     1882     1883     1897     1898     1899     1900     1901
U 1160           1902     1903     1904     1905     1906     1907     1908     1909
U 1168           1910     1911     1912     1913     1914     1915     1916     1917
U 1170           1918     1919     1922     1923     1966     1967     1968     1969
U 1178           1970     1971     1972     1973     1974     1975     1976     1977
U 1180           1978     1979     1980     1981     1983     1984     1985     1986
U 1188           1988     1998     1999     2007     2008     2009     2023     2286
U 1190           2287     2288     2289     2290     2301     2302     2303     2304
U 1198           2305     2306     2307     2355     2369     2370     2371     2372
```

```
;Location      0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0         2373    2374    2375    2389    2390    2391    2392    2393
U 11A8         2394    2395    2396    2397    2398    2399    2400    2401
U 11B0         2402    2410    2413    2426    2427    2428    2429    2430
U 11B8         2433    2434    2449    2450    2451    2452    2453    2454
U 11C0         2455    2456    2465    2474    2475    2476    2477    2480
U 11C8         2481    2490    2497    2498    2499    2500    2501    2502
U 11D0         2511    2518    2519    2520    2521    2522    2523    2524
U 11D8         2525    2538    2539    2540    2541    2542    2543    2544
U 11E0         2545    2554    2561    2562    2563    2564    2565    2566
U 11E8         2567    2568    2605    2612    2619    2620    2623    2624
U 11F0         2625    2626    2627    2628    2629    2678    2687    2688
U 11F8         2689    2692    2693    2694    2695    2698    2699    2719
U 1200         2028:   2029:   2030:   2031:   2032:   2033:   2034:   2035:
U 1208         2036:   2037:   2038:   2039:   2040:   2041:   2042:   2043:
U 1210         2044:   2045:   2046:   2047:   2048:   2049:   2050:   2051:
U 1218         2052:   2053:   2054:   2055:   2056:   2057:   2058:   2059:
U 1220         2060:   2061:   2062:   2063:   2064:   2065:   2066:   2067:
U 1228         2068:   2069:   2070:   2071:   2072:   2073:   2074:   2075:
U 1230         2076:   2077:   2078:   2079:   2080:   2081:   2082:   2083:
U 1238         2084:   2085:   2086:   2087:   2088:   2089:   2090:   2091:
U 1240         2092:   2093:   2094:   2095:   2096:   2097:   2098:   2099:
U 1248         2100:   2101:   2102:   2103:   2104:   2105:   2106:   2107:
U 1250         2108:   2109:   2110:   2111:   2112:   2113:   2114:   2115:
U 1258         2116:   2117:   2118:   2119:   2120:   2121:   2122:   2123:
U 1260         2124:   2125:   2126:   2127:   2128:   2129:   2130:   2131:
U 1268         2132:   2133:   2134:   2135:   2136:   2137:   2138:   2139:
U 1270         2140:   2141:   2142:   2143:   2144:   2145:   2146:   2147:
U 1278         2148:   2149:   2150:   2151:   2152:   2153:   2154:   2155:
U 1280         2156:   2157:   2158:   2159:   2160:   2161:   2162:   2163:
U 1288         2164:   2165:   2166:   2167:   2168:   2169:   2170:   2171:
U 1290         2172:   2173:   2174:   2175:   2176:   2177:   2178:   2179:
U 1298         2180:   2181:   2182:   2183:   2184:   2185:   2186:   2187:
U 12A0         2188:   2189:   2190:   2191:   2192:   2193:   2194:   2195:
U 12A8         2196:   2197:   2198:   2199:   2200:   2201:   2202:   2203:
U 12B0         2204:   2205:   2206:   2207:   2208:   2209:   2210:   2211:
U 12B8         2212:   2213:   2214:   2215:   2216:   2217:   2218:   2219:
U 12C0         2220:   2221:   2222:   2223:   2224:   2225:   2226:   2227:
U 12C8         2228:   2229:   2230:   2231:   2232:   2233:   2234:   2235:
U 12D0         2236:   2237:   2238:   2239:   2240:   2241:   2242:   2243:
U 12D8         2244:   2245:   2246:   2247:   2248:   2249:   2250:   2251:
U 12E0         2252:   2253:   2254:   2255:   2256:   2257:   2258:   2259:
U 12E8         2260:   2261:   2262:   2263:   2264:   2265:   2266:   2267:
U 12F0         2268:   2269:   2270:   2271:   2272:   2273:   2274:   2275:
U 12F8         2276:   2277:   2278:   2279:   2280:   2281:   2282:   2283:
U 1300         2720    2723    2724    2725    2726    2729    2730    2810
U 1308         2811    2818    2819    2820    2821    2822    2827    2828
U 1310         2829    2830    2831    2834    2835    2836    2837    2838
U 1318         2839    2910    2911    2912    2913    2914    2915    2916
U 1320         2917    2918    2919    2920    2921    2922    2923    2924
U 1328         2925    2926    2927    2928    2929    2930    2931    2932
U 1330         2933    2940    2947    2948    2951    2952    2953    2961
U 1338         2962    2963    2964    2965    2966    2967    2978    2979
U 1340         2984    2985    2986    2987    2995    2996    2997    2998
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348           2999    3002    3003    3004    3005    3006    3007    3008
U 1350           3009    3019    3022    3023    3028    3029    3030    3031
U 1358           3034    3035    3036    3039    3040    3041    3042    3043
U 1360           3051    3052    3053    3054    3064    3067    3068    3076
U 1368           3077    3078    3081    3082    3083    3091    3092    3093
U 1370           3094    3095    3096    3097    3107    3108    3111    3113
U 1378           3114    3115    3116    3123    3124    3125    3126    3127
U 1380           3130    3131    3132    3133    3134    3142    3143    3144
U 1388           3145    3146    3147    3148    3151    3152    3161    3162
U 1390           3165    3167    3168    3169    3170    3175    3176    3177
U 1398           3178    3181    3182    3183    3184    3185    3193    3194
U 13A0           3195    3196    3197    3198    3199    3202    3203    3220
U 13A8           3221    3222    3230    3231    3232    3233    3234    3235
U 13B0           3236    3253    3254    3255    3263    3264    3265    3266
U 13B8           3267    3268    3269    3278    3281    3290    3291    3292
U 13C0           3300    3301    3302    3303    3304    3305    3306    3307
U 13C8           3308    3376    3377    3384    3389    3390    3391    3392
U 13D0           3393    3396    3397    3398    3399    3400    3439    3440
U 13D8           3441    3448    3456    3457    3460    3461    3462    3463
U 13E0           3464    3465    3466    3504    3522    3523    3524    3536
U 13E8           3537    3538    3547    3548    3549    3578
U 13F0           1934:   1935:   1936:   1937:   1938:   1939:   1940:   1941:
U 13F8           1942:   1943:   1944:   1945:   1946:   1947:   1948:   1949:
```

```
          Words not
          in bounds
 ESK00DEF         0
 ESK00MAC         0
 ESKAHMAC         0
  ESKAH37      1022

Used           1022
Remaining

Total microwords used in memory U: 1022
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH37.MIC


Pass 1 warnings:     0   Pass 2 warnings:     0
Pass 1 errors:       0   Pass 2 errors:       0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 2132  TEST 13D          DATA PATH CONTEXT LATCH
; 2208  TEST 13E          SIGN OF SOURCE DEPENDENT ON IR<1>
; 2291  TEST 13F          INSTRUCTION DEPENDENT ALU ROM
; 2598  TEST 140          COND CODE LOAD =1,2,4, 3 & 5 & 6(C & V BIT ONLY)
; 2819  TEST 141          CONDITION CODE LOAD = 3 (N AND Z BIT)
; 2979  TEST 142          CONDITION CODE LOAD = 5 & 6 (N AND Z BIT)
; 3200  TEST 143          INSTRUCTION DEPENDENT COND CODE LOAD (C BIT)
; 3448  TEST 144          INSTRUCTION DEPENDENT COND CODE LOAD (V BIT)
```

```
;1        .NOLIST
;1804     .LIST
;1805
```

```
                                    ;1806   .REGION/1000,13FF
                                    ;1807
                                    ;1808   ;+
                                    ;1809   ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                    ;1810   ; WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
                                    ;1811   ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                    ;1812   ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                    ;1813   ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                    ;1814   ;
                                    ;1815   ; FOR EXAMPLE: IF A TEST EXPECTED A ''TB MISS'' MICRO TRAP IT WOULD SET BIT
                                    ;1816   ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                    ;1817   ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                    ;1818   ;       R[OF] AND DO A RETURNO.
                                    ;1819   ;
                                    ;1820   ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                    ;1821   ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                    ;1822   ; TO THE CONSOLE.
                                    ;1823   ;
                                    ;1824   ; THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
                                    ;1825   ; ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURNO IF THE TRAP WAS
                                    ;1826   ; EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
                                    ;1827   ; RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
                                    ;1828   ; STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.
                                    ;1829   ;-
                                    ;1830
U 1100, 0000,003C,19C0,0A78,0084,7001 ;1831  1100:   SC_K[ZERO],Q_R[OF],J/TRPHO      ; SYSTEM INIT
U 1101, 0000,003C,05C0,0A78,0084,7001 ;1832  1101:   SC_K[.1],Q_R[OF],J/TRPHO        ; DATA UNALIGNED
U 1102, 0000,003C,09C0,0A78,0084,7001 ;1833  1102:   SC_K[.2],Q_R[OF],J/TRPHO        ; X PAGE ERROR
U 1103, 0000,003C,0DC0,0A78,0084,7001 ;1834  1103:   SC_K[.3],Q_R[OF],J/TRPHO        ; TB MODIFY
U 1104, 0000,003C,11C0,0A78,0084,7001 ;1835  1104:   SC_K[.4],Q_R[OF],J/TRPHO        ; TB PROT ERROR
U 1105, 0000,003C,D5C0,0A78,0084,7001 ;1836  1105:   SC_K[.6],Q_R[OF],J/TRPHO        ; TB MISS
U 1106, 0000,003C,D9C0,0A78,0084,7001 ;1837  1106:   SC_K[.9],Q_R[OF],J/TRPHO        ; RES FLOAT OPER
U 1107, 0000,003C,5DC0,0A78,0084,7001 ;1838  1107:   SC_K[.7],Q_R[OF],J/TRPHO        ; TB PARITY
U 1108, 0000,003C,01C0,0A78,0084,7001 ;1839  1108:   SC_K[.8],Q_R[OF],J/TRPHO        ; CACHE PARITY
U 110C, 0000,003C,85C0,0A78,0084,7001 ;1840  110C:   SC_K[.C],Q_R[OF],J/TRPHO        ; RDS
U 110D, 0000,003C,89C0,0A78,0084,7001 ;1841  110D:   SC_K[.D],Q_R[OF],J/TRPHO        ; TIME OUT
U 110E, 0000,003C,65C0,0A78,0084,7001 ;1842  110E:   SC_K[.10],Q_R[OF],J/TRPHO       ; ODD ADDRESS
U 110F, 0000,003C,61C0,0A78,0084,7154 ;1843  110F:   SC_K[.F],Q_R[OF],J/TRPH2        ; CS PARITY
                                    ;1844
U 1001, 0001,2024,0180,0800,0010,1026 ;1845  TRPHO:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 1026, 0000,013C,0180,0800,0000,1002 ;1846          Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000 ;1847  =0      ALU_Q[AND]MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN
                                    ;1848
                                    ;1849
                                    ;1850   ;+
                                    ;1851   ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                    ;1852   ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                    ;1853   ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                    ;1854   ;
                                    ;1855   ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                    ;1856   ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                    ;1857   ;             FAULT STATUS REGISTER
                                    ;1858   ;             SBI ERROR REGISTER
                                    ;1859   ;             TIMEOUT ADDRESS REGISTER
                                    ;1860   ;             MAINTENANCE REGISTER
```

```
                                            ;1861   ;               CACHE PARITY REGISTER
                                            ;1862   ;               TB ERROR REGISTER 1
                                            ;1863   ;               TB ERROR REGISTER 0
                                            ;1864   ;-
                                            ;1865
U 1003, 0018,0038,1D80,09E8,0000,1004       ;1866   TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,71C1       ;1867   =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,102E       ;1868           Q_ID[TBER0]
U 102E, 0001,203C,4DF0,2DB0,0000,1036       ;1869           RC[6]_Q,Q_ID[TBER1]
U 1036, 0001,203C,65F0,2DB8,0000,103E       ;1870           RC[7]_Q,Q_ID[SBI.ERR]
U 103E, 0001,203C,6DF0,2DD8,0000,104F       ;1871           RC[0B]_Q,Q_ID[FAULT]
U 104F, 0001,203C,75F0,2DE0,0000,105B       ;1872           RC[0C]_Q,Q_ID[MAINT]
U 105B, 0001,203C,79F0,2DC8,0000,105F       ;1873           RC[9]_Q,Q_ID[PARITY]
U 105F, 0001,203C,69F0,2DC0,0000,1109       ;1874           RC[8]_Q,Q_ID[TIME.ADDR]
U 1109, 0001,203C,81F0,2DD0,0000,1000       ;1875           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,11A6       ;1876   1000:   RC[0E]_Q,ERROR1
                                            ;1877
                                            ;1878   ;+
                                            ;1879   ; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
                                            ;1880   ;-
                                            ;1881
U 1154, 0001,2024,0180,0800,0010,1190       ;1882   TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC        ; WAS THE TRAP EXPECTED?
U 1190, 0000,013C,0180,0800,0000,1006       ;1883           Z?                                ; BRANCH IF NO
U 1006, 0001,2036,0180,0AF8,0000,0001       ;1884   =0      ALU_Q[AND]MASK,R[0F]_ALU,RETURN1 ; RETURN
U 1007, 0000,003C,0180,0800,0000,1003       ;1885           J/TRPH1                           ; REPORT UNEXPECTED TRAP
                                            ;1886
                                            ;1887
                                            ;1888   ;+
                                            ;1889   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                            ;1890   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                            ;1891   ;                NEWTST
                                            ;1892   ;                ERLOOP
                                            ;1893   ;                ERROR1
                                            ;1894   ;                ERROR2
                                            ;1895   ;
                                            ;1896
U 1191, 0000,003C,65F8,0800,0084,7192       ;1897   SCOPE:  SC_K[.10],Q_0                     ; SETUP TO WRITE IPL OF 1F
U 1192, 0818,0038,8D80,0800,0000,1193       ;1898           D_K[.1F]                          ; ...
U 1193, 0D00,003C,0180,0800,0000,1194       ;1899           D_DAL.SC
U 1194, 0000,003C,3D80,3C00,0000,1195       ;1900           ID[PSL]_D                         ; WRITE THE PSL
U 1195, 0818,0038,0580,0800,0000,1196       ;1901           D_K[.1]                           ; SETUP TO CLEAR THE CES REGISTER
U 1196, 0D00,003C,0180,0800,0000,1197       ;1902           D_DAL.SC
U 1197, 0F00,003C,3180,3C00,0000,1198       ;1903           ID[CES]_D,D_0                     ; CLEAR THE CES REGISTER
U 1198, 0000,003C,5D80,3C00,0000,1199       ;1904           ID[ACC.CS]_D                      ; SHUT OFF THE FLOATING POINT
U 1199, 0000,003C,3980,3C00,0000,119A       ;1905           ID[SIR]_D                         ; CLEAR THE SIR REGISTER
U 119A, 0000,003C,2980,3C00,0000,119B       ;1906           ID[CLK.CS]_D                      ; STOP INTERVAL TIMER
U 119B, 0000,003C,4980,3C00,0000,119C       ;1907           ID[TBER0]_D                       ; SHUT OFF THE TB
U 119C, 0000,003C,7180,3C00,0000,119D       ;1908           ID[COMP]_D                        ; CLEAR SILO COMPARATOR
U 119D, 0818,0038,C180,0800,0000,119E       ;1909           D_K[.FFFF]
U 119E, 0000,003C,6580,3C00,0000,119F       ;1910           ID[SBI.ERR]_D
U 119F, 0F00,003C,6D80,3C00,0000,11A0       ;1911           ID[FAULT]_D,D_0
U 11A0, 0000,003C,6D80,3C00,0000,11A1       ;1912           ID[FAULT]_D
U 11A1, 0000,003C,6580,3C00,0000,11A2       ;1913           ID[SBI.ERR]_D
U 11A2, 0003,003C,0180,09F0,0000,11A3       ;1914           RC[0E]_0
U 11A3, 0003,003C,0180,0AF8,0000,11A4       ;1915           R[0F]_0
```

```
U 11A4, 0003,003C,0180,09E8,0000,105E   ;1916          RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 11A5, 0818,0038,0980,0800,0000,105E   ;1917   ERLOOP: D_K[.2],J/CALLCON              ; ERRLOOP CALL
U 11A6, 0810,0038,0180,0978,0000,11A7   ;1918   ERROR1: D_RC[0F]
U 11A7, 0819,0034,4D80,0800,0000,104E   ;1919          D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1920   104E:   D_D.OR.K[.4],J/CALLCON
                                        ;1921
U 11A8, 0810,0038,0180,0978,0000,11A9   ;1922   ERROR2: D_RC[0F]
U 11A9, 0819,0034,4D80,0800,0000,105A   ;1923          D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1924   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1925
                                        ;1926   105E:
                                        ;1927   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1928          ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1929
                                        ;1930   ;+
                                        ;1931   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1932   ;-
                                        ;1933
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1934   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1935   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1936   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1937   13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1938   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1939   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1940   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1941   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1942   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1943   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1944   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1945   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1946   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1947   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1948   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,11AA   ;1949   13FF:   NOP
                                        ;1950
                                        ;1951
                                        ;1952   ;+
                                        ;1953   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
                                        ;1954   ; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
                                        ;1955   ; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
                                        ;1956   ; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
                                        ;1957   ;
                                        ;1958   ; FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
                                        ;1959   ;       THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
                                        ;1960   ;
                                        ;1961   ;               =0      D_0,CALL,J/DC5
                                        ;1962   ;                       NOP
                                        ;1963   ;               =0      CALL,J/DC5
                                        ;1964   ;-
                                        ;1965
U 11AA, 0018,0038,1980,0800,0000,11BA   ;1966   DC0:    ALU_0(K),J/S00
U 11AB, 0018,0038,1980,0800,0000,11BB   ;1967   DC1:    ALU_0(K),J/S01
U 11AC, 0018,0038,1980,0800,0000,11BC   ;1968   DC2:    ALU_0(K),J/S10
U 11AD, 0018,0038,1980,0800,0000,11BD   ;1969   DC3:    ALU_0(K),J/S11
U 11AE, 0018,0038,0980,0800,0000,11BA   ;1970   DC4:    ALU_K[.2],J/S00
```

```
U 11AF, 0018,0038,0980,0800,0000,11BB     DC5:     ALU_K[.2],J/S01
U 11B0, 0018,0038,0980,0800,0000,11BC     DC6:     ALU_K[.2],J/S10
U 11B1, 0018,0038,0980,0800,0000,11BD     DC7:     ALU_K[.2],J/S11
U 11B2, 0018,0038,0580,0800,0000,11BA     DC8:     ALU_K[.1],J/S00
U 11B3, 0018,0038,0580,0800,0000,11BB     DC9:     ALU_K[.1],J/S01
U 11B4, 0018,0038,0580,0800,0000,11BC     DCA:     ALU_K[.1],J/S10
U 11B5, 0018,0038,0580,0800,0000,11BD     DCB:     ALU_K[.1],J/S11
U 11B6, 0018,0038,C180,0800,0000,11BA     DCC:     ALU_K[.FFFF],J/S00
U 11B7, 0018,0038,C180,0800,0000,11BB     DCD:     ALU_K[.FFFF],J/S01
U 11B8, 0018,0038,C180,0800,0000,11BC     DCE:     ALU_K[.FFFF],J/S10
U 11B9, 0018,0038,C180,0800,0000,11BD     DCF:     ALU_K[.FFFF],J/S11

U 11BA, 0118,0038,1B80,0800,0000,11BE     S00:     ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 11BB, 0118,0038,0B80,0800,0000,11BE     S01:     ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 11BC, 0118,0038,0780,0800,0000,11BE     S10:     ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 11BD, 0118,0038,C380,0800,0000,11BE     S11:     ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX

U 11BE, 0100,003E,0380,0800,0000,0001     SX:      D_D.LEFT2,SI/7,RETURN1            ; EXIT



                                          ;+
                                          ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                          ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                          ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                          ; TYPING IT.
                                          ;-

U 11BF, 0810,0038,4D80,0978,0000,11C0     SUBTST: D_RC[OF],KMX/.FF00
U 11C0, 0019,4016,4D80,09F8,0000,0001              RC[OF]_D+K[.FF00],WORD,RETURN1

                                          ;+
                                          ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                          ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                          ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                          ;-

U 11C1, 0010,0038,01C0,0978,0000,11C2     SETRCF: Q_RC[OF]
U 11C2, 0019,2034,4DC0,0800,0000,11C3              Q_Q.AND.K[.FF00]
U 11C3, 0019,2032,1D80,09F8,0000,0001              RC[OF]_Q.OR.SC,RETURN1

```

```
U 1155, 0019,2000,05C0,0800,0000,12AB      1155:   Q_Q-K[.1],J/12AB
                                           ;+
                                           ; THIS INSTRUCTION EXECUTES THE SUB/SPEC FUNCTION WHICH IS USED TO
                                           ; LATCH THE DATA TYPE IN THE INSTRUCTION BUFFER.
                                           ;-

U 11C4, 0038,003B,41C0,0800,0000,1200      DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/1200


U 1200, 0000,003E,0180,0800,0000,0001      1200:   RETURN1                         ; MOVB S^#,S^#
U 1202, 0000,003E,0180,0800,0000,0001      1202:   RETURN1
U 1204, 0000,003E,0180,0800,0000,0001      1204:   RETURN1                         ; MOVB R0,X
U 1206, 0000,003E,0180,0800,0000,0001      1206:   RETURN1                         ; MOVQ R0,R0
U 1208, 0000,003E,0180,0800,0000,0001      1208:   RETURN1                         ; MOVX  (R0),XX
U 128F, 0000,003E,0180,0800,0000,0001      128F:   RETURN1                         ; HALT
U 12C4, 0000,003E,0180,0800,0000,0001      12C4:   RETURN1                         ; MOVB R0,R0
U 12AA, 0000,003C,0180,0800,0000,1010      12AA:   NOP                             ; ECO'D LOCATION


                                           ;+
                                           ; THIS SUBROUTINE IS USED BY THE BRANCH TESTS. IT PUTS A NUMBER IN THE
                                           ; Q REGISTER CORRESPONDING TO THE BRANCH BITS THAT WERE ASSERTED. IT MUST
                                           ; BE CALLED WITH A SUBROUTINE CALL AND THE BRANCH ENABLED.
                                           ;-

                                           =000
                                           IBBRTABLE:
U 1010, 0000,003E,01F8,0800,0000,0001              Q_0,RETURN1
U 1011, 0018,003A,05C0,0800,0000,0001              Q_K[.1],RETURN1
U 1012, 0018,003A,09C0,0800,0000,0001              Q_K[.2],RETURN1
U 1013, 0018,003A,0DC0,0800,0000,0001              Q_K[.3],RETURN1
U 1014, 0018,003A,11C0,0800,0000,0001      REIENT: Q_K[.4],RETURN1
U 1015, 0018,0038,11C0,0800,0000,11C5              Q_K[.4],J/ADDONE
U 1016, 0018,003A,D5C0,0800,0000,0001              Q_K[.6],RETURN1
U 1017, 0018,003A,5DC0,0800,0000,0001              Q_K[.7],RETURN1
U 11C5, 0019,2016,05C0,0800,0000,0001      ADDONE: Q_Q+K[.1],RETURN1


                                           ;+
                                           ; THIS ROUTINE IS USED TO FETCH THE AMX, BMX, AND EXPECTED DATA FROM THE
                                           ; CACHE, LOAD THE INSTRUCTION BUFFER, AND EXECUTE A SUB/SPEC TO LATCH THE
                                           ; DATA TYPE IN THE INSTRUCTION BUFFER.
                                           ;
                                           ; IT MUST BE CALLED WITH THE ADDRESS OF THE AMX DATA IN RA[2], THE ADDRESS
                                           ; OF THE BMX DATA IN RA[3], THE ADDRESS OF THE EXPECTED DATA IN RA[4], AND
                                           ; THE ADDRESS OF THE INSTRUCTION BUFFER DATA IN RA[1]. IT RETURNS WITH
                                           ; THE AMX DATA IN RA[0], THE BMX DATA IN RC[0], AND THE EXPECTED DATA
                                           ; IN RC[0E].
                                           ;-

                                           GETDATA:
U 11C6, 0000,003C,0180,0A10,0200,11C7              VA_R[2]                         ; LOAD ADR OF AMX DATA
U 11C7, 0000,003C,0180,C800,0000,11C8              D[[ONG]_CACHE.P                 ; FETCH
U 11C8, 0001,003C,0180,0A80,0000,11C9              R[0]_D                          ; SAVE
```

```
U 11C9, 0000,003C,0180,0A18,0200,11CA            VA_R[3]                          ; LOAD ADR OF BMX DATA
U 11CA, 0000,003C,0180,C800,0000,11CB            D[LONG]_CACHE.P                  ; FETCH
U 11CB, 0001,003C,0180,0980,0000,11CC            RC[0]_D                          ; SAVE
U 11CC, 0000,003C,0180,0A20,0200,11CD            VA_R[4]                          ; LOAD ADR OF EXP DATA
U 11CD, 0000,803C,0180,C800,0000,11CE            D[BYTE]_CACHE.P                  ; FETCH
U 11CE, 0019,0034,4980,09F0,0000,1008            RC[0E]_D.AND.K[.FF]              ; SAVE
U 1008, 2000,003D,0180,0A08,4200,11DF    =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE IB
U 1009, 0000,003C,0180,0800,0000,11C4            J/DISPAT                         ; EXECUTE THE CALL 3 AND RETURN


                                         ;+
                                         ; THIS SUBROUTINE LOADS THE V BIT, IN THE PSL, WITH THE COMPLIMENT OF THE
                                         ; V BIT IN RC[0E], AND RETURNS.
                                         ;-

                                         INITVBIT:
U 11CF, 0813,001C,0180,0970,0000,11D0            D_NOT.RC[0E]                     ; GET COMPLIMENT EXP DATA
U 11D0, 0819,0034,0980,0800,0000,11D1            D_D.AND.K[.2]                    ; MASK
U 11D1, 0000,003C,3DF0,2C00,0000,11D2            Q_ID[PSL]                        ; READ THE PSL
U 11D2, 0019,2024,09C0,0800,0000,11D3            Q_Q.ANDNOT.K[.2]                 ; MASK THE V BIT
U 11D3, 081D,0030,0180,0800,0000,11D4            D_D.OR.Q                         ; INSERT COMP OF EXP V BIT
U 11D4, 0000,003C,3D80,3E00,0000,11D5            ID[PSL]_D,LAB_R[0]               ; LOAD THE V BIT
U 11D5, 0810,0038,0180,0970,0000,11D6            D_RC[0E]                         ; GET EXPECTED DATA
U 11D6, 0000,003E,0180,0900,0000,0001            LC_RC[0],RETURN1                 ; LATCH BMX DATA


                                         ;+
                                         ; THIS ROUTINE LOADS THE N BIT, IN THE PSL, WITH THE COMPLIMENT OF THE
                                         ; N BIT IN RC[0E], AND RETURNS.
                                         ;-

                                         INITNBIT:
U 11D7, 0813,001C,0180,0970,0000,11D8            D_NOT.RC[0E]                     ; GET COMPLIMENT EXP DATA
U 11D8, 0819,0034,0180,0800,0000,11D9            D_D.AND.K[.8]                    ; MASK
U 11D9, 0000,003C,3DF0,2C00,0000,11DA            Q_ID[PSL]                        ; READ THE PSL
U 11DA, 0019,2024,01C0,0800,0000,11DB            Q_Q.ANDNOT.K[.8]                 ; MASK THE N BIT
U 11DB, 081D,0030,0180,0800,0000,11DC            D_D.OR.Q                         ; INSERT COMP OF EXP N BIT
U 11DC, 0000,003C,3D80,3E00,0000,11DD            ID[PSL]_D,LAB_R[0]               ; LOAD THE V BIT
U 11DD, 0810,0038,0180,0970,0000,11DE            D_RC[0E]                         ; GET EXPECTED DATA
U 11DE, 0000,003E,0180,0900,0000,0001            LC_RC[0],RETURN1                 ; LATCH BMX DATA


                                         ;+
                                         ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
                                         ; CACHE REFERANCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
                                         ; IS COMPLETELY FULL OF DATA.
                                         ;
                                         ; BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
                                         ;-

U 11DF, 3000,003C,0180,6000,0000,11E0    IBWAIT: LOAD.IB,IBC/START
U 11E0, 0000,003C,0180,F800,0000,11E1            MCT/ALLOW.IB.READ
U 11E1, 0000,003C,0180,F800,0000,11E2            MCT/ALLOW.IB.READ
U 11E2, 0000,003C,0180,F800,0000,11E3            MCT/ALLOW.IB.READ
U 11E3, 0000,003C,0180,F800,0000,11E4            MCT/ALLOW.IB.READ
```

```
U 11E4, 0000,003C,0180,F800,0000,11E5    ;2121              MCT/ALLOW.IB.READ
U 11E5, 1000,003E,0180,F800,0000,0001    ;2122              MCT/ALLOW.IB.READ,IBC/STOP,RETURN1
                                         ;2123      ;
                                         ;2124      ; THIS ROUTINE IS USED TO SET THE COMPATABILITY MODE BIT IN THE PSL
                                         ;2125      ;
U 11E6, 0000,003C,3DF0,2C00,0000,11E7    ;2126      SETCM:  Q_ID[PSL]
U 11E7, 0000,003C,8D80,0800,0084,71E8    ;2127              SC_K[.1F]
U 11E8, 0803,001C,0180,0800,0000,11E9    ;2128              D_NOT.MASK
U 11E9, 081D,0030,0180,0800,0000,11EA    ;2129              D_D.OR.Q
U 11EA, 0000,003E,3D80,3C00,0000,0001    ;2130              ID[PSL]_D,RETURN1
                                         ;2131
```

```
                                              ;2132   .PAGE   "TEST 13D        DATA PATH CONTEXT LATCH"
                                              ;2133   ;*******************************************************************
                                              ;2134   ;++
                                              ;2135   ; TEST  13D     DATA PATH CONTEXT LATCH
                                              ;2136   ;
                                              ;2137   ; TEST DESCRIPTION
                                              ;2138   ;       THIS TEST CHECKS THE CONTEXT LATCH IN THE DATA PATH BY LOADING
                                              ;2139   ;       THE IB WITH OPCODES OF DATA TYPE BYTE, WORD, AND LONG, DOING
                                              ;2140   ;       AN AMX SIGN EXTEND FUNCTION, AND CHECKING THAT THE SIGN EXTEND
                                              ;2141   ;       OCCURRED ON THE CORRECT BOUNDRY.
                                              ;2142   ;
                                              ;2143   ; LOGIC DESCRIPTION
                                              ;2144   ;       THIS TEST CHECKS THE CONTEXT LATCH AND THE CONTEXT GATES ON THE
                                              ;2145   ;       DAP MODULE.
                                              ;2146   ;
                                              ;2147   ; ERROR DESCRIPTION
                                              ;2148   ;       DATA: EXPECTED SIGN EXTENDED DATA
                                              ;2149   ;             RECEIVED SIGN EXTENDED DATA
                                              ;2150   ;             LOOP COUNT -- INDICATES THE DA^A TYPE CURRENTLY UNER TEST,
                                              ;2151   ;               I.E. 3=BYTE, 2=WORD, AND 1=LONG.
                                              ;2152   ;
                                              ;2153   ; SYNC POINT DESCRIPTION
                                              ;2154   ;       ADDRESS SYNCOD--AMX ENABLED FOR SIGN EXTEND
                                              ;2155   ;--
                                              ;2156   ;*******************************************************************
                                              ;2157   =0
U 100A, 0018,0039,0D80,09F8,0000,1191          ;2158   T13D:   NEWTST[.3]
U 100B, 0818,0038,A580,0800,0000,11EB          ;2159           D_K[.60]
U 11EB, 0019,0014,1180,0A88,0000,11EC          ;2160           R[1]_D+K[.4]                    ; SET ADR OF IB DATA
U 11EC, 0818,0038,4580,0800,0000,11ED          ;2161           D_K[.8000]
U 11ED, 0000,003C,4180,0800,0000,11EE          ;2162           KMX/.80
U 11EE, 0819,0014,4180,0A80,0000,11EF          ;2163           R[0]_D+K[.80],D_ALU             ; INIT DATA TO SIGN EXTEND
U 11EF, 0002,803C,D5C0,0800,0084,71F0          ;2164           Q_D.SXT[BYTE],SC_K[.6]          ; GEN EXP DATA FOR BYTE
U 11F0, 0001,203C,0180,08E8,0000,11F1          ;2165           R(SC)_Q                         ; SAVE IN R6
U 11F1, 0002,403C,05C0,0800,0084,B1F2          ;2166           Q_D.SXT[WORD],SC_SC-K[.1]       ; GEN EXP DATA FOR WORD
U 11F2, 0001,203C,0180,08E8,0000,11F3          ;2167           R(SC)_Q                         ; SAVE IN R5
U 11F3, 0001,003C,0180,0AA0,0000,11F4          ;2168           R[4]_D                          ; AND LONG
U 11F4, 0000,003C,D580,0800,0084,71F5          ;2169           SC_K[.6]                        ; INIT REGISTER ADDRESS
                                              ;2170
                                              ;2171   ;////////////////////////////////////////;/////////////////////////
                                              ;2172   ;+
                                              ;2173   ; START THE TEST
                                              ;2174   ;-
                                              ;2175
U 11F5, 0018,0038,0D80,09E0,0000,11F6          ;2176   T13DS1: RC[0C]_K[.3]                    ; SET THE LOOP COUNT
U 11F6, 0800,003C,0180,0868,0000,11F7          ;2177   T13DL1: D_R(SC)                         ; GET EXP DATA
U 11F7, 0001,003C,0180,09F0,0000,100C          ;2178           RC[0E]_D
U 100C, 0000,003D,0180,0800,0000,11A5          ;2179   =0      ERLOOP
U 100D, 0810,0038,0180,0970,0000,1018          ;2180           D_RC[0E]                        ; GET EXP DATA
U 1018, 2000,003D,0180,0A08,4200,11DF          ;2181   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1019, 0000,003C,0180,0800,0000,101A          ;2182           NOP
U 101A, 0000,003D,0180,0800,0000,11C4          ;2183   =0      CALL,J/DISPAT                   ; LOAD THE CONTEXT LATCH
U 101B, 0000,003C,01C0,0A00,0000,11F8          ;2184           Q_R[0]                          ; GET DATA TO SIGN EXTEND
U 11F8, 0002,E03C,01C0,0800,0000,11F9          ;2185   SYNCOD: Q_Q.SXT[INST.DEP]               ; SIGN EXTEND ACCORDING TO DT
U 11F9, 001D,2000,0180,0800,0010,11FA          ;2186           A[U_Q-D,CLK.UBCC                ; CHECK
```

```
U 11FA, 0000,013C,0180,0800,0000,101C   ;2187           Z?                                   ; BRANCH IF OK
U 101C, 0001,203D,0180,09E8,0000,11A8   ;2188   =0      ERROR2,RC[0D]_Q
U 101D, 0000,003C,0580,0800,0084,B1FB   ;2189           SC_SC-K[.1]                          ; SELECT NEXT EXP DATA
U 11FB, 0800,003C,0180,0A08,0000,11FC   ;2190           D_R[1]
U 11FC, 0019,0014,1180,0A88,0000,11FD   ;2191           R[1]_D+K[.4]                         ; INCREMENT ADR OF IB DATA
U 11FD, 0810,0038,0180,0960,0000,11FE   ;2192           D_RC[0C]
U 11FE, 0019,8000,0580,09E0,0010,11FF   ;2193           RC[0C]_D-K[.1],CLK.UBCC,BYTE         ; DECREMENT LOOP COUNT
U 11FF, 0000,013C,0180,0800,0000,1020   ;2194           Z?
U 1020, 0000,003C,0180,0800,0000,11F6   ;2195   =0      J/T13DL1
U 1021, 0000,003C,0180,0800,0000,1022   ;2196           NOP
                                        ;2197
                                        ;2198   ; THE FOLLOWING DATA IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2199   ;% 64
                                        ;2200   ; DATA TYPE BYTE
                                        ;2201   ;$ 5090,0050
                                        ;2202   ; DATA TYPE WORD
                                        ;2203   ;$ 50B0,0050
                                        ;2204   ; DATA TYPE LONG
                                        ;2205   ;$ 50D0,0050
                                        ;2206
                                        ;2207
```

```
                                                 .PAGE   "TEST 13E      SIGN OF SOURCE DEPENDENT ON IR<1>"
                                          ;**************************************************************************
                                          ;++
                                          ; TEST  13E     SIGN OF SOURCE DEPENDENT ON IR<1>
                                          ;
                                          ; TEST DESCRIPTION
                                          ;        THIS TEST CHECKS THAT THE SIGN OF THE SOURCE (SS) CLEARS WHEN
                                          ;        IR<1> IS CLEAR AND SETS WHEN IR<1> IS SET WHEN EXECUTING THE
                                          ;        FUNCTION SGN/ADD.SUB.
                                          ;
                                          ;        SUBTST 1 - CHECK WITH IR<1>=0
                                          ;        SUBTST 2 - CHECK WITH IR<1>=1
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;        THIS TEST CHECKS ONE LEG OF THE SS MULTIPLEXOR ON THE DAP MODULE.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;        DATA: LOOP COUNT -- INDICATES WHAT THE INITIAL VALUE OF THE SS IS,
                                          ;                I.E., 2=SS WAS 0, 1=SS WAS 1.
                                          ;
                                          ; SYNC POINT DESCRIPTION
                                          ;        SUBTST 1 - SYNCFF--SIGN OF SOURCE GETS LOADED
                                          ;        SUBTST 2 - SYNC0E--SIGN OF SOURCE GETS LOADED
                                          ;--
                                          ;**************************************************************************
                                          =0
U 1022, 0018,0039,0580,09F8,0000,1191     T13E:   NEWTST[.1]
U 1023, 0003,003C,0180,0A80,0000,1024             R[0]_0                     ; INIT DATA TO SETUP SS
U 1024, 0818,0039,5D80,0800,0000,11AA     =0      D_K[.7],CALL,J/DC0         ; GEN ADDRESS OF IB DATA
U 1025, 0001,003C,0180,0A88,0000,1201             R[1]_D

                                          ;////////////////////////////////////////////////////////////////////////
                                          ;+
                                          ; CHECK WITH IR<1>=0
                                          ;-

U 1201, 0018,0038,0980,09F0,0000,1028     T13ES1: R[0E]_K[.2]                ; SET THE LOOP COUNT
U 1028, 0000,003D,0180,0800,0000,11BF     =0      SUBTEST
U 1029, 0000,003C,0180,0800,0000,102A             NOP
U 102A, 2000,003D,0180,0A08,4200,11DF     =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 102B, 0000,003C,0180,0800,0000,102C             NOP
U 102C, 0000,003D,0180,0800,0000,11A5     =0      ERLOOP
U 102D, 0000,003C,0181,0A00,0000,1203     T13EL1: ALU_R[0],SGN/LOAD.SS       ; INIT THE SS
U 1203, 0000,003C,0186,0A00,0000,1205     SYNCFF: ALU_R[0],SGN/ADD.SUB       ; EXECUTE THE TEST FUNCTION
U 1205, 0000,123C,0180,0800,0000,100E             EALU?                      ; BRANCH IF SS BAD
U 100E, 0000,003C,0180,0800,0000,1207     =1110   J/T19P1
U 100F, 0000,003D,0180,0800,0000,11A6             ERROR1                     ; SS SHOULD BE CLEAR
U 1207, 0018,0038,4580,0A80,0000,1209     T19P1:  R[0]_K[.8000]              ; SELECT NEW DATA TO INIT SS
U 1209, 0810,0038,0180,0970,0000,120A             D_R[0E]
U 120A, 0019,8000,0580,09F0,0010,120B             R[0E]_D-K[.1],CLK.UBCC,BYTE ; DECREMENT LOOP COUNT
U 120B, 0000,013C,0180,0800,0000,1030             Z?
U 1030, 0000,003C,0180,0800,0000,102D     =0      J/T13EL1


                                          ;////////////////////////////////////////////////////////////////////////
```

```
                                            ;2263   ;+
                                            ;2264   ; NOW CHECK WITH IR<1>=1
                                            ;2265   ;-
                                            ;2266
U 1031, 0000,003C,0180,0A08,0000,120C       ;2267   T13ES2: LAB_R[1]
U 120C, 0018,0014,0580,0A88,0000,1032       ;2268           R[1]_LA+K[.1]                  ; INCREMENT ADR OF IB DATA
U 1032, 0000,003D,0180,0800,0000,11BF       ;2269   =0      SUBTEST
U 1033, 0003,003C,0180,0A80,0000,120D       ;2270           R[0]_0                         ; INIT VALUE OF SS
U 120D, 0018,0038,0980,09F0,0000,1034       ;2271           RC[OE]_K[.2]                   ; SET THE LOOP COUNT
U 1034, 2000,003D,0180,0A08,4200,11DF       ;2272   =0      ALU_R[T],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1035, 0000,003C,0180,0800,0000,1038       ;2273           NOP
U 1038, 0000,003D,0180,0800,0000,11A5       ;2274   =0      ERLOOP
U 1039, 0000,003C,0181,0A00,0000,120E       ;2275   T13EL2: ALU_R[0],SGN/LOAD.SS           ; INIT THE SS
U 120E, 0000,003C,0186,0A00,0000,120F       ;2276   SYNCOE: ALU_R[0],SGN/ADD.SUB           ; EXECUTE THE TEST FUNCTION
U 120F, 0000,123C,0180,0800,0000,101E       ;2277           EALU?
U 101E, 0000,003D,0180,0800,0000,11A6       ;2278   =1110   ERROR1                         ; SS DID NOT SET
U 101F, 0018,0038,4580,0A80,0000,1210       ;2279           R[0]_K[.8000]                  ;
U 1210, 0810,0038,0180,0970,0000,1211       ;2280           D_RC[OE]
U 1211, 0019,8000,0580,09F0,0010,1212       ;2281           RC[OE]_D-K[.1],CLK.UBCC,BYTE   ; DECREMENT THE LOOP COUNT
U 1212, 0000,013C,0180,0800,0000,103A       ;2282           Z?
U 103A, 0000,003C,0180,0800,0000,1039       ;2283   =0      J/T13EL2
U 103B, 0000,003C,0180,0800,0000,103C       ;2284           NOP
                                            ;2285
                                            ;2286
                                            ;2287   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                            ;2288   ;% 70
                                            ;2289   ;$ 0200
                                            ;2290
```

```
.PAGE   "TEST 13F       INSTRUCTION DEPENDENT ALU ROM"
;**********************************************************************
;++
; TEST  13F     INSTRUCTION DEPENDENT ALU ROM
;
; TEST DESCRIPTION
;       THIS TEST LOADS THE INSTRUCTION BUFFER WITH OPCODES AND PUTS DATA
;       ON THE ALEG AND BLEG OF THE ALU TO TEST EACH POSSIBLE FUNCTION OF
;       THE ALU IN INSTRUCTION DEPENDENT MODE. FOLLOWING IS A LIST OF THE
;       OPCODES, THE ALU FUNCTION, THE ALEG AND BLEG DATA, AND THE EXPECTED
;       ALU OUTPUT THAT IS USED IN THIS TEST.
;       THE ALEG, BLEG, AND EXPECTED ALU DATA ARE ALSO FETCHED FROM THE
;       CACHE.
;
; VAX MODE
;
;       OPCODE  ALUFCT  ALEG    BLEG    ALU
;       ------  ------  ----    ----    ---
;
;       80      A PL B   9       5      0E
;       82      A MI B   9       5       4
;       88      A + B   55      AA      FF
;       8A      A * -B  FF      00      FF
;       8C      A XOR B 55      AA      FF
;       8E      0 MI B  FF      01      FF
;       90        B     00      FF      FF
;       91      A-B-1   02      01      00
;       92       -B     00      00      FF
;       93      A * B   55      AA      00
;       94        0     55      AA      00
;       96      A PL 1  FF      FF      00
;       97      A MI 1  01      01      00
;       E6      A + -B  55      55      FF
;
;       D8      A+B+PSLC FE     01      FF,00
;       D9      A-B-PSLC 02     01      01,00
;       F8      A-B--PSLC 02    01      00,01
;
; COMPATABILITY MODE                            OCTAL OPCODE
;                                               ------------
;
;       6000    A PL B   9       5      0E      060000
;       E400    A MI B   9       5      04      162000
;       5000    A + B   55      AA      FF      050000
;       4000    A * -B  FF      00      FF      040000
;       7800    A XOR B 55      AA      FF      074000
;       8B00    0 MI B  FF      01      FF      105400
;       1000      B     00      FF      FF      010000
;       2000    A-B-1   02      01      00      020000
;       3000    A * B   55      AA      00      030000
;       0A00      0     55      AA      00      005000
;       0A80    A PL 1  FF      FF      00      005200
;       0AC0    A MI 1  01      01      00      005300
;       0A40     -A     00      FF      FF      C05100
;       0CC0    A PL A  55      FF      AA      006300
```

```
                                      ;        0C40    A PL A+C 55      FF      AB      006100
                                      ;
                                      ;        SUBTST 1 - CHECK VAX MODE FUNCTIONS EXCLUDING THOSE WITH C BIT
                                      ;        SUBTST 2 - CHECK VAX MODE FUNCTIONS THAT REQUIRE C BIT
                                      ;        SUBTST 3 - CHECK THE COMPATABILITY MODE FUNCTIONS
                                      ;
                                      ; LOGIC DESCRIPTION
                                      ;        THIS TEST CHECKS THAT THE OPCODE BITS FROM THE INSTRUCTION BUFFER
                                      ;        ARE RECEIVED ON THE DAP MODULE AND THAT THE ALU ROMS FUNCTION CORRECTLY
                                      ;        ON THE DAP MODULE. THE 3 OPCODES THAT USE THE PSL C BIT ALSO USE A
                                      ;        SPECIAL CIRCUIT ON THE DAP MODULE.
                                      ;
                                      ; ERROR DESCRIPTION
                                      ;        DATA: EXPECTED ALU OUTPUT
                                      ;              RECEIVED ALU OUTPUT
                                      ;              LOOP COUNT -- INDICATES WHICH OPCODE (AND ALU FUNCTION AND
                                      ;                DATA) IS CURRENTLY BEING TESTED.
                                      ;              LOOP COUNT - SUBTEST 2 ONLY -- INDICATES WHETHER THE PSL C BIT
                                      ;                IS SET OR CLEAR, I.E. 2=PSL C CLEAR, 1=PSL C SET
                                      ;
                                      ; SYNC POINT DESCRIPTION
                                      ;        SUBTST 1 - SYNC0F--ALU FUNCTION IS EXECUTED
                                      ;        SUBTST 2 - SYNC10--ALU FUNCTION IS EXECUTED
                                      ;        SUBTST 3 - SYNC11--ALU FUNCTION IS EXECUTED
                                      ;--
                                      ;***********************************************************************
                                      =0
U 103C, 0018,0039,0D80,09F8,0000,1191 T13F:   NEWTST[.3]
U 103D, 0018,0038,9580,0A88,0000,1040         R[1]_K[.B0]
U 1040, 0818,0039,5D80,0800,0000,11AE =0      D_K[.7],CALL,J/DC4              ; ADR OF ALEG DATA
U 1041, 0001,003C,0180,0A90,0000,1213         R[2]_D
U 1213, 0018,0038,C580,0A98,0000,1042         R[3]_K[.88]                     ; ADR OF B LEG DATA
U 1042, 0818,0039,D980,0800,0000,11B6 =0      D_K[.9],CALL,J/DCC              ; ADR OF ALU OUTPUT DATA
U 1043, 0001,003C,0180,0AA0,0000,1214         R[4]_D

                                      ;///////////////////////////////////////////////////////////////////////
                                      ;+
                                      ; CHECK VAX MODE FUNCTIONS EXCEPT THOSE REQUIRING C BIT
                                      ;-

U 1214, 0818,0038,8980,0800,0000,1215 T13FS1: D_K[.D]
U 1215, 0019,0014,0580,09E0,0000,1044         R[0C]_D+K[.1]                   ; SET THE LOOP COUNT
U 1044, 0000,003D,0180,0800,0000,11BF =0      SUBTEST
U 1045, 0000,003C,0180,0A10,0200,1216 T13FL1: VA_R[2]
U 1216, 0000,803C,0180,C800,0000,1217         D[BYTE]_CACHE.P                 ; GET ALEG DATA
U 1217, 0819,0034,4980,0800,0000,1218         D_D.AND.K[.FF]                  ; MASK
U 1218, 0001,003C,0180,0AA8,0000,1219         R[5]_D
U 1219, 0000,003C,0180,0A20,0200,121A         VA_R[4]
U 121A, 0000,803C,0180,C800,0000,121B         D[BYTE]_CACHE.P                 ; GET ALU OUTPUT DATA
U 121B, 0819,0034,4980,0800,0000,121C         D_D.AND.K[.FF]                  ; MASK
U 121C, 0001,003C,0180,09F0,0000,121D         R[0E]_D
U 121D, 0000,003C,0180,0A18,0200,121E         VA_R[3]
U 121E, 0000,803C,0180,C800,0000,121F         D[BYTE]_CACHE.P                 ; GET B LEG DATA
U 121F, 0819,0034,4980,0800,0000,1220         D_D.AND.K[.FF]                  ; MASK
U 1220, 0001,003C,0180,0AB0,0000,1046         R[6]_D                          ;
```

```
U 1046, 0000,003D,0180,0800,0000,11A5   ;2401   =0      ERLOOP
U 1047, 0800,003C,0180,0A28,0000,1221   ;2402           D_R[5]
U 1221, 0000,003C,01C0,0A30,0000,1048   ;2403           Q_R[6]
U 1048, 2000,003D,0180,0A08,4200,11DF   ;2404   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1049, 001D,000C,01C0,0800,0000,1222   ;2405   SYNC0F: Q_D[INST.DEP]Q                  ; EXECUTE THE ALU FUNCTION
U 1222, 0810,0038,0180,0970,0000,1223   ;2406           D_RC[0E]                        ; GET EXPECTED RESULT
U 1223, 001D,A000,0180,0800,0010,1224   ;2407           A[U_Q-D,CLK.UBCC,BYTE           ; CHECK THE RESULT
U 1224, 0000,013C,0180,0800,0000,104A   ;2408           Z?                              ; BRANCH IF OK
U 104A, 0001,203D,0180,09E8,0000,11A8   ;2409   =0      ERROR2,RC[0D]_Q
                                        ;2410
                                        ;2411   ;+
                                        ;2412   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;2413   ;-
                                        ;2414
U 104B, 0000,003C,0180,0A08,0000,1225   ;2415           LAB_R[1]
U 1225, 0018,0014,0580,0A88,0000,1226   ;2416           R[1]_LA+K[.1]                   ; INCREMENT IB ADR
U 1226, 0000,003C,0180,0A10,0000,1227   ;2417           LAB_R[2]
U 1227, 0018,0014,0580,0A90,0000,1228   ;2418           R[2]_LA+K[.1]                   ; INCREMENT ADR OF A LEG DATA
U 1228, 0000,003C,0180,0A18,0000,1229   ;2419           LAB_R[3]
U 1229, 0018,0014,0580,0A98,0000,122A   ;2420           R[3]_LA+K[.1]                   ; INCRE ADR OF B LEG DATA
U 122A, 0000,003C,0180,0A20,0000,122B   ;2421           LAB_R[4]
U 122B, 0018,0014,0580,0AA0,0000,122C   ;2422           R[4]_LA+K[.1]                   ; INCRE ADR OF ALU OUTPUT DATA
U 122C, 0810,0038,0180,0960,0000,122D   ;2423           D_RC[0C]
U 122D, 0019,8000,0580,09E0,0010,122E   ;2424           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 122E, 0000,013C,0180,0800,0000,104C   ;2425           Z?
U 104C, 0000,003C,0180,0800,0000,1045   ;2426   =0      J/T13FL1
                                        ;2427
                                        ;2428
                                        ;2429   ;///////////////////////////////////////////////////////////////////////
                                        ;2430   ;+
                                        ;2431   ; NOW CHECK THE THREE FUNCTIONS WITH THE PSL C BIT
                                        ;2432   ;-
                                        ;2433
U 104D, 0F18,0038,0980,09D8,0000,122F   ;2434   T13FS2: RC[0B]_K[.2],D_0                ; SET LOOP COUNT
U 122F, 0000,003C,3DF0,2C00,0000,1230   ;2435           Q_ID[PSL]                       ; GET THE PSL
U 1230, 0819,2024,6180,0800,0000,1231   ;2436           D_Q.ANDNOT.K[.F]                ; CLEAR THE CC'S
U 1231, 0000,003C,3D80,3C00,0000,1050   ;2437           ID[PSL]_D                       ; LOAD THE PSL
U 1050, 0000,003D,1180,0800,0084,71C1   ;2438   =0      SETRCF[.4]
U 1051, 0000,003C,0180,0800,0000,1052   ;2439   =0      NOP
U 1052, 0000,003D,0180,0800,0000,11BF   ;2440   =0      SUBTEST
U 1053, 0018,0038,0D80,09E0,0000,1232   ;2441   T13FL2: RC[0C]_K[.3]                    ; SET LOOP FOR 3 FUNCTIONS
U 1232, 0000,003C,0180,0A10,0200,1233   ;2442   T13FL3: VA_R[2]
U 1233, 0000,803C,0180,C800,0000,1234   ;2443           D[BYTE]_CACHE.P                 ; GET ALEG DATA
U 1234, 0001,003C,0180,0AA8,0000,1235   ;2444           R[5]_D
U 1235, 0000,003C,0180,0A20,0200,1236   ;2445           VA_R[4]
U 1236, 0000,803C,0180,C800,0000,1237   ;2446           D[BYTE]_CACHE.P                 ; GET ALU OUTPUT DATA
U 1237, 0001,003C,0180,09F0,0000,1238   ;2447           RC[0E]_D
U 1238, 0000,003C,0180,0A18,0200,1239   ;2448           VA_R[3]
U 1239, 0000,803C,0180,C800,0000,123A   ;2449           D[BYTE]_CACHE.P                 ; GET B LEG DATA
U 123A, 0001,003C,0180,0AB0,0000,1054   ;2450           R[6]_D                          ;
U 1054, 0000,003D,0180,0800,0000,11A5   ;2451   =0      ERLOOP
U 1055, 0800,003C,0180,0A28,0000,123B   ;2452           D_R[5]
U 123B, 0000,003C,01C0,0A30,0000,1056   ;2453           Q_R[6]
U 1056, 2000,003D,0180,0A08,4200,11DF   ;2454   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1057, 001D,000C,01C0,0800,0000,123C   ;2455   SYNC10: Q_D[INST.DEP]Q                  ; EXECUTE THE ALU FUNCTION
```

```
U 123C, 0810,0038,0180,0970,0000,123D   ;2456           D_RC[0E]                        ; GET EXPECTED RESULT
U 123D, 001D,A000,0180,0800,0010,123E   ;2457           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE RESULT
U 123E, 0000,013C,0180,0800,0000,1058   ;2458           Z?                              ; BRANCH IF OK
U 1058, 0001,203D,0180,09E8,0000,11A8   ;2459   =0      ERROR2,RC[0D]_Q
                                        ;2460
                                        ;2461   ;+
                                        ;2462   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;2463   ;-
                                        ;2464
U 1059, 0000,003C,0180,0A08,0000,123F   ;2465           LAB_R[1]
U 123F, 0018,0014,0580,0A88,0000,1240   ;2466           R[1]_LA+K[.1]                   ; INCREMENT IB ADR
U 1240, 0000,003C,0180,0A10,0000,1241   ;2467           LAB_R[2]
U 1241, 0018,0014,0580,0A90,0000,1242   ;2468           R[2]_LA+K[.1]                   ; INCREMENT ADR OF A LEG DATA
U 1242, 0000,003C,0180,0A18,0000,1243   ;2469           LAB_R[3]
U 1243, 0018,0014,0580,0A98,0000,1244   ;2470           R[3]_LA+K[.1]                   ; INCRE ADR OF B LEG DATA
U 1244, 0000,003C,0180,0A20,0000,1245   ;2471           LAB_R[4]
U 1245, 0018,0014,0580,0AA0,0000,1246   ;2472           R[4]_LA+K[.1]                   ; INCRE ADR OF ALU OUTPUT DATA
U 1246, 0810,0038,0180,0960,0000,1247   ;2473           D_RC[0C]
U 1247, 0019,8000,0580,09E0,0010,1248   ;2474           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 1248, 0000,013C,0180,0800,0000,105C   ;2475           Z?
U 105C, 0000,003C,0180,0800,0000,1232   ;2476   =0      J/T13FL3
U 105D, 0818,0038,0580,0800,0000,1249   ;2477           D_K[.1]
U 1249, 0000,003C,3DF0,2C00,0000,124A   ;2478           Q_ID[PSL]                       ; READ THE PSL
U 124A, 0019,2024,61C0,0800,0000,124B   ;2479           Q_Q.ANDNOT.K[.F]                ; CLEAR THE CC'S
U 124B, 081D,0030,0180,0800,0000,124C   ;2480           D_D.OR.Q                        ; INSERT THE C BIT
U 124C, 0000,003C,3D80,3C00,0000,124D   ;2481           ID[PSL]_D                       ; SET THE C BIT
U 124D, 0810,0038,0180,0958,0000,124E   ;2482           D_RC[0B]
U 124E, 0019,8000,0580,09D8,0010,124F   ;2483           RC[0B]_D-K[.1],CLK.UBCC,BYTE
U 124F, 0000,013C,0180,0800,0000,1060   ;2484           Z?
U 1060, 0000,003C,0180,0800,0000,1053   ;2485   =0      J/T13FL2
                                        ;2486
                                        ;2487
                                        ;2488   ;////////////////////////////////////////////////////////////////////////
                                        ;2489   ;+
                                        ;2490   ; NOW CHECK COMPATABILITY MODE
                                        ;2491   ;-
                                        ;2492
U 1061, 0818,0038,D180,0800,0000,1250   ;2493   T13FS3: D_K[.C0]
U 1250, 0019,0014,1180,0A90,0000,1062   ;2494           R[2]_D+K[.4]
U 1062, 0000,003D,0D80,0800,0084,71C1   ;2495   =0      SETRCF[.3]
U 1063, 0000,003C,0180,0800,0000,1064   ;2496           NOP
U 1064, 0818,0039,8980,0800,0000,11AE   ;2497   =0      D_K[.D],CALL,J/DC4              ; GEN ADR OF BLEG DATA
U 1065, 0001,003C,0180,0A98,0000,1066   ;2498           R[3]_D
U 1066, 0000,003D,0180,0800,0000,11BF   ;2499   =0      SUBTEST
U 1067, 0818,0038,CD80,0800,0000,1251   ;2500           D_K[.F0]                        ; GEN ADR OF ALU DATA
U 1251, 0019,0000,0180,0AA0,0000,1252   ;2501           R[4]_D-K[.8]                    ; EQUALS E8(16)
U 1252, 0818,0038,4980,0800,0000,1253   ;2502           D_K[.FF]                        ; GEN ADR OF IB DATA
U 1253, 0019,0000,0D80,0A88,0000,1254   ;2503           R[1]_D-K[.3]                    ; EQUALS FC(16)
U 1254, 0818,0038,0580,0800,0000,1255   ;2504           D_K[.1]
U 1255, 0000,003C,3D80,3C00,0000,1256   ;2505           ID[PSL]_D                       ; SET THE C BIT IN THE PSL
                                        ;2506
U 1256, 0018,0038,6180,09E0,0000,1257   ;2507           RC[0C]_K[.F]                    ; SET THE LOOP COUNT
U 1257, 0000,003C,0180,0A10,0200,1258   ;2508   T13FL4: VA_R[2]                         ; GET ALEG DATA
U 1258, 0000,803C,0180,C800,0000,1259   ;2509           D[BYTE]_CACHE.P
U 1259, 0001,003C,0180,0AA8,0000,125A   ;2510           R[5]_D                          ; SAVE IN R5
```

```
U 125A, 0000,003C,0180,0A20,0200,125B   ;2511            VA_R[4]                         ; GET ALU OUTPUT DATA
U 125B, 0000,803C,0180,C800,0000,125C   ;2512            D[BYTE]_CACHE.P
U 125C, 0001,003C,0180,09F0,0000,125D   ;2513            RC[0E]_D                        ; SAVE IN RC E
U 125D, 0000,003C,0180,0A18,0200,125E   ;2514            VA_R[3]                         ; GET BLEG DATA
U 125E, 0000,803C,0180,C800,0000,125F   ;2515            D[BYTE]_CACHE.P                 ; ...
U 125F, 0001,003C,0180,0AB0,0000,1068   ;2516            R[6]_D                          ; SAVE IN R6
U 1068, 0000,003D,0180,0800,0000,11A5   ;2517    =0      ERLOOP
U 1069, 0000,003C,0180,0800,0000,106A   ;2518            NOP
U 106A, 2000,003D,0180,0A08,4200,11DF   ;2519    =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 106B, 0000,003C,0180,0800,0000,106C   ;2520            NOP
U 106C, 0000,003D,0180,0800,0000,11E6   ;2521    =0      CALL,J/SETCM                    ; SET THE CM BIT
U 106D, 0800,003C,0180,0A28,0000,1260   ;2522            D_R[5]                          ; GET ALEG DATA
U 1260, 0000,003C,01C0,0A30,0000,1261   ;2523            Q_R[6]                          ; GET BLEG DATA
U 1261, 001D,000C,01C0,0800,0000,1262   ;2524    SYNC11: Q_D[INST.DEP]Q                  ; EXECUTE THE FUNCTION
U 1262, 0810,0038,0180,0970,0000,1263   ;2525            D_RC[0E]                        ; GET EXPECTED ALU OUTPUT
U 1263, 001D,A000,0180,0800,0010,1264   ;2526            ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE RESULT
U 1264, 0000,013C,0180,0800,0000,106E   ;2527            Z?
U 106E, 0001,A03D,0180,09E8,0000,11A8   ;2528    =0      ERROR2,RC[0D]_Q,BYTE                    ; ALU OUTPUT INCORRECT
                                        ;2529
                                        ;2530    ;+
                                        ;2531    ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;2532    ;-
                                        ;2533
U 106F, 0000,003C,0180,0A08,0000,1265   ;2534            LAB_R[1]
U 1265, 0018,0014,0980,0A88,0000,1266   ;2535            R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 1266, 0000,003C,0180,0A10,0000,1267   ;2536            LAB_R[2]
U 1267, 0018,0014,0580,0A90,0000,1268   ;2537            R[2]_LA+K[.1]                   ; INCREMENT ADR OF ALEG DATA
U 1268, 0000,003C,0180,0A18,0000,1269   ;2538            LAB_R[3]
U 1269, 0018,0014,0580,0A98,0000,126A   ;2539            R[3]_LA+K[.1]                   ; INCREMENT ADR OF BLEG DATA
U 126A, 0000,003C,0180,0A20,0000,126B   ;2540            LAB_R[4]
U 126B, 0018,0014,0580,0AA0,0000,126C   ;2541            R[4]_LA+K[.1]                   ; INCREMENT ADR OF ALU DATA
U 126C, 0810,0038,0180,0960,0000,126D   ;2542            D_RC[0C]
U 126D, 0019,8000,0580,09E0,0010,126E   ;2543            RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT THE BYTE COUNT
U 126E, 0000,013C,0180,0800,0000,1070   ;2544            Z?
U 1070, 0000,003C,0180,0800,0000,1257   ;2545    =0      J/T13FL4
U 1071, 0000,003C,0180,0800,0000,1072   ;2546            NOP
                                        ;2547
                                        ;2548
                                        ;2549    ; FOLLOWING IS THE ALEG DATA FOR THE ABOVE TEST
                                        ;2550    ;% 74
                                        ;2551    ; SUBTEST 1
                                        ;2552    ;$ 0909,FF55,FF55,0200,5500,FF55.5501
                                        ;2553    ; SUBTEST 2
                                        ;2554    ;$ 02FE,FE02,0202
                                        ;2555    ;
                                        ;2556    ; FOLLOWING IS THE B LEG DATA FOR THE ABOVE TEST:
                                        ;2557    ;% 88
                                        ;2558    ; SUBTEST 1
                                        ;2559    ;$ 0505,00AA,01AA,01FF,AA00,FFAA,5501
                                        ;2560    ; SUBTEST 2
                                        ;2561    ;$ 0101,0101,0101
                                        ;2562    ;
                                        ;2563    ; FOLLOWING IS THE EXPECTED ALU OUTPUT FOR THE ABOVE TEST:
                                        ;2564    ;% 9C
                                        ;2565    ; SUBTEST 1
```

```
;2566   ;$ 040E,FFFF,FFFF,00FF,00FF,0000,FF00
;2567   ; SUBTEST 2
;2568   ;$ 01FF,0000,0100
;2569   ;
;2570   ; FOLLOWING IS THE OP CODES FOR THE ABOVE TEST:
;2571   ;% B0
;2572   ; SUBTEST 1
;2573   ;$ 8280,8A88,8E8C,9190,9392,9694,E697
;2574   ; SUBTEST 2
;2575   ;$ D9D8,D8F8,F8D9
;2576
;2577
;2578   ; THE FOLLOWING IS THE COMPATABILITY MODE DATA FOR THE ABOVE TEST:
;2579   ; THESE ARE ONLY USED IN SUBTEST 3
;2580   ; ALEG DATA
;2581   ;% C4
;2582   ;$ 0909,FF55,FF55,0200,5555,01FF,5500,0055
;2583   ;
;2584   ; BLEG DATA
;2585   ;% D4
;2586   ;$ 0505,00AA,01AA,01FF,AAAA,01FF,FFFF,FFFF
;2587   ;
;2588   ; ALU OUTPUT DATA
;2589   ;% E8
;2590   ;$ 040E,FFFF,FFFF,00FF,0000,0000,AAFF,00AB
;2591   ;
;2592   ; IB DATA
;2593   ; SEE THE TEST HEADER FOR THE EQUIVALENT OCTAL DATA FOR THE FOLLOWING OPCODES
;2594   ;% FC
;2595   ;$ 6000,E400,5000,4000,7800,8800,1000,2000,3000,0A00,0A80,0AC0,0A40,0CC0,0C40
;2596
;2597
```

```
                                              .PAGE   "TEST 140       COND CODE LOAD =1,2,4, 3 & 5 & 6(C & V BIT ONLY)"
                                              ;*********************************************************************
                                              ;++
                                              ; TEST  140      COND CODE LOAD =1,2,4, 3 & 5 & 6(C & V BIT ONLY)
                                              ;
                                              ; TEST DESCRIPTION
                                              ;       THIS TEST FLOATS A ONE AND A ZERO THRU THE CONDITION CODES USING
                                              ;       THE CONDITION CODE LOADS OF 1, 2, AND 4. IT ALSO CHECKS BOTH
                                              ;       CONDITIONS (ONE AND ZERO) OF THE C AND V BIT FOR CONDITION CODE
                                              ;       LOADS OF 3, 5, AND 6. ALL OF THESE CASES CAUSE THE CURRENT VALUE
                                              ;       OF THE CONDITION CODE BIT TO BE WRITTEN INTO ITSELF.
                                              ;
                                              ;       SUBTST 1 - CHECK THE CONDITION CODE LOAD = 1.
                                              ;       SUBTST 2 - CHECK THE CONDITION CODE LOAD = 2
                                              ;       SUBTST 3 - CHECK THE CONDITION CODE LOAD = 3 (C AND V BIT)
                                              ;       SUBTST 4 - CHECK THE CONDITION CODE LOAD = 5 (C AND V BIT)
                                              ;       SUBTST 5 - CHECK THE CONDITION CODE LOAD = 6 (C AND V BIT)
                                              ;
                                              ; LOGIC DESCRIPTION
                                              ;       THIS TEST CHECKS PART OF THE CONDITION CODE ROMS, AND THE
                                              ;       MULTIPLEXORS THAT FEED THE CONDITION CODE LATCH ON THE CEH
                                              ;       MODULE.
                                              ;
                                              ; ERROR DESCRIPTION
                                              ;       DATA: EXPECTED CONDITION CODES
                                              ;             RECEIVED CONDITION CODES
                                              ;             LOOP COUNT
                                              ;               SUBTST 1,2 - INDICATES WHICH DATA PATTERN IS BEING TESTED
                                              ;               I.E. 8=0001, 7=0010, 6=0100, 5=1000, 4=1110, 3=1101, ETC.
                                              ;               SUBTST 3 - INDICATES EXPECTED CONFIGURATION OF C AND V BITS
                                              ;               I.E. 2=01, 1=10
                                              ;               NOT USED FOR SUBTEST 4 AND 5.
                                              ;
                                              ; SYNC POINT DESCRIPTION
                                              ;       SUBTST 1 - SYNC02--EXECUTE UCCK = 1
                                              ;       SUBTST 2 - SYNC03--EXECUTE UCCK = 2
                                              ;       SUBTST 3 - SYNC05--EXECUTE UCCK = 3
                                              ;       SUBTST 4 - SYNC06--EXECUTE UCCK = 5
                                              ;       SUBTST 5 - SYNC07--EXECUTE UCCK = 6
                                              ;--
                                              ;*********************************************************************
                                              =0
U 1072, 0018,0039,1180,09F8,0000,1191         T140:   NEWTST[.4]
U 1073, 0818,0038,1180,0800,0000,126F                 D_K[.4]                         ; GET A CONSTANT 5
U 126F, 0019,0014,0580,0AA8,0000,1270                 R[5]_D+K[.1]

                                              ;/////////////////////////////////////////////////////////////////////
                                              ;+
                                              ; FLOAT A 1 AND A ZERO THROUGH THE CC'S WITH UCCK=1
                                              ;-

U 1270, 0018,0038,0180,09E0,0000,1074         T140S1: RC[0C]_K[.8]                    ; SET THE LOOP COUNT
U 1074, 0000,003D,0180,0800,0000,11BF         =0      SUBTEST
U 1075, 0018,0038,0580,09F0,0000,1076                 RC[0E]_K[.1]                    ; INIT THE TEST DATA
U 1076, 0000,003D,0180,0800,0000,11A5         =0      ERLOOP
```

```
U 1077, 0810,0038,0180,0970,0000,1271    ;2653   T140L1: D_RC[0E]                        ; PUT DATA PATTERN IN D REG
U 1271, 0000,003C,3D80,3C00,0000,1272    ;2654           ID[PSL]_D                       ; LOAD THE CC'S
U 1272, 0000,003C,0180,0800,0010,1273    ;2655   SYNC02: CLK.UBCC                        ; EXECUTE THE TEST INSTRUCTION
U 1273, 0000,003C,3DF0,2C00,0000,1274    ;2656           Q_ID[PSL]                       ; READ THE CC'S BACK
U 1274, 0019,2034,61C0,0800,0000,1275    ;2657           Q_Q.AND.K[.F]                   ; MASK THE RECEIVED DATA
U 1275, 001D,A000,0180,0800,0010,1276    ;2658           A[U_Q-D,CLK.UBCC,BYTE           ; CHECK THE RECEIVED DATA
U 1276, 0000,013C,0180,0800,0000,1078    ;2659           Z?
U 1078, 0001,203D,0180,09E8,0000,11A8    ;2660   =0      ERROR2,RC[0D]_Q
                                         ;2661
                                         ;2662   ;+
                                         ;2663   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                         ;2664   ;-
                                         ;2665
U 1079, 0810,0038,0180,0960,0000,1277    ;2666           D_RC[0C]                        ; GET THE LOOP COUNT
U 1277, 0000,003C,01C0,0A28,0000,1278    ;2667           Q_R[5]                          ; GET CONSTANT 5
U 1278, 001D,8000,0180,0800,0010,1279    ;2668           A[U_D-Q,CLK.UBCC,BYTE           ; TIME TO FLOAT A ZERO?
U 1279, 0000,013C,0180,0800,0000,107A    ;2669           Z?                              ; BRANCH IF YES
U 107A, 0000,003C,0180,0800,0000,127B    ;2670   =0      J/T140P1
U 107B, 0018,0038,89C0,0800,0000,127A    ;2671           Q_K[.D]
U 127A, 0019,2014,0580,09F0,0000,1281    ;2672           RC[0E]_Q+K[.1],J/T140P4         ; INIT DATA FOR FLOATING ZERO
U 127B, 0000,003C,01C0,0A28,0000,127C    ;2673   T140P1: Q_R[5]
U 127C, 001D,8000,0180,0800,0010,127D    ;2674           A[U_D-Q,CLK.UBCC,BYTE           ; FLOATING A ZERO OR A ONE?
U 127D, 0010,1838,01C0,0970,0000,1027    ;2675           ALU.N?,Q_RC[0E]                 ; BRANCH IF FLOATING A ZERO
U 1027, 0000,003C,0180,0800,0000,127E    ;2676   =0111   J/T140P2
U 102F, 0000,003C,03A8,0800,0000,127F    ;2677           Q_Q.LEFT,SI/MUL-,J/T140P3       ; SHIFT THE ZERO INSERTING A 1
U 127E, 0000,003C,01A8,0800,0000,127F    ;2678   T140P2: Q_Q.LEFT,SI/ZERO                ; SHIFT THE ONE INSERTING A ZERO
U 127F, 0019,2034,61C0,0800,0000,1280    ;2679   T140P3: Q_Q.AND.K[.F]
U 1280, 0001,203C,0180,09F0,0000,1281    ;2680           RC[0E]_Q                        ; SAVE IN RC E
U 1281, 0019,8000,0580,09E0,0010,1282    ;2681   T140P4: RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT THE LOOP COUNT
U 1282, 0000,013C,0180,0800,0000,107C    ;2682           Z?                              ; BRANCH IF DONE
U 107C, 0000,003C,0180,0800,0000,1077    ;2683   =0      J/T140L1                                ; CONTINUE
                                         ;2684
                                         ;2685
                                         ;2686   ;///////////////////////////////////////////////////////////////////////////
                                         ;2687   ;+
                                         ;2688   ; FLOAT A ONE AND A ZERO THROUGH THE CC'S WITH A UCCK=2
                                         ;2689   ;-
                                         ;2690
U 107D, 0018,0038,0180,09E0,0000,107E    ;2691   T140S2: RC[0C]_K[.8]                    ; SET THE LOOP COUNT
U 107E, 0018,0039,0580,0A90,0000,11BF    ;2692   =0      SUBTEST,R[2]_K[.1]
U 107F, 0018,0038,0D80,09F0,0000,1080    ;2693           RC[0E]_K[.3]                    ; INIT THE EXPECTED CC'S
                                         ;2694
U 1080, 0000,003D,0180,0800,0000,11A5    ;2695   =0      ERLOOP
U 1081, 0800,003C,0180,0A10,0000,1283    ;2696   T140L2: D_R[2]                          ; GET THE TEST PATTERN
U 1283, 0000,003C,3D80,3C00,0000,1284    ;2697           ID[PSL]_D                       ; LOAD THE CC'S
U 1284, 0810,0038,0180,0970,0020,1285    ;2698   SYNC03: D_RC[0E],SET.V                  ; EXECUTE THE TEST INSTRUCTION
U 1285, 0000,003C,3DF0,2C00,0000,1286    ;2699           Q_ID[PSL]                       ; GET THE CC'S
U 1286, 0019,2034,61C0,0800,0000,1287    ;2700           Q_Q.AND.K[.F]                   ; MASK THE CC'S
U 1287, 001D,A000,0180,0800,0010,1288    ;2701           A[U_Q-D,CLK.UBCC,BYTE           ; CHECK THE CC'S
U 1288, 0000,013C,0180,0800,0000,1082    ;2702           Z?                              ; BRANCH IF OK
U 1082, 0001,203D,0180,09E8,0000,11A8    ;2703   =0      ERROR2,RC[0D]_Q
                                         ;2704
                                         ;2705   ;+
                                         ;2706   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                         ;2707   ;-
```

```
                                          ;2708
U 1083, 0810,0038,0180,0960,0000,1289    ;2709            D_RC[0C]                         ; GET THE LOOP COUNT
U 1289, 0000,003C,01C0,0A28,0000,128A    ;2710            Q_R[5]                           ; GET A CONSTANT 5
U 128A, 001D,8000,0180,0800,0010,128B    ;2711            A[U_D-Q,CLK.UBCC,BYTE            ; TIME TO FLOAT A ZERO?
U 128B, 0000,013C,0180,0800,0000,1084    ;2712            Z?                               ; BRANCH IF YES
U 1084, 0000,003C,0180,0800,0000,128E    ;2713    =0      J/T140P5
U 1085, 0018,0038,89C0,0800,0000,128C    ;2714            Q_K[.D]
U 128C, 0019,2014,0580,0A90,0000,128D    ;2715            R[2]_Q+K[.1]                     ; INIT DATA FOR FLOATING ZERO
U 128D, 0019,2014,0580,09F0,0000,1297    ;2716            RC[0E]_Q+K[.1],J/T140P8          ; ...
U 128E, 0000,003C,01C0,0A28,0000,1290    ;2717    T140P5: Q_R[5]
U 1290, 001D,8000,0180,0800,0010,1291    ;2718            A[U_D-Q,CLK.UBCC,BYTE            ; FLOATING A ZERO OR ONE?
U 1291, 0000,1B3C,01C0,0A10,0000,1037    ;2719            ALU.N?,Q_R[2]                    ; BRANCH IF FLOATING A ZERO
U 1037, 0000,003C,0180,0800,0000,1292    ;2720    =0111   J/T140P6
U 103F, 0000,003C,03A8,0800,0000,1293    ;2721            Q_Q.LEFT,SI/MUL-,J/T140P7        ; SHIFT THE ZERO INSERTING A 1
U 1292, 0000,003C,01A8,0800,0000,1293    ;2722    T140P6: Q_Q.LEFT,SI/ZERO                 ; SHIFT THE ONE INSERTING A ZERO
U 1293, 0019,2034,61C0,0800,0000,1294    ;2723    T140P7: Q_Q.AND.K[.F]
U 1294, 0001,203C,0180,0A90,0000,1295    ;2724            R[2]_Q                           ; SAVE IN R2
U 1295, 0019,2030,09C0,0800,0000,1296    ;2725            Q_Q.OR.K[.2]                     ; INSERT THE V BIT
U 1296, 0001,203C,0180,09F0,0000,1297    ;2726            RC[0E]_Q                         ; SAVE
U 1297, 0019,8000,0580,09E0,0010,1298    ;2727    T140P8: RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT THE LOOP COUNT
U 1298, 0000,013C,0180,0800,0000,1086    ;2728            Z?
U 1086, 0000,003C,0180,0800,0000,1081    ;2729    =0      J/T140L2
                                          ;2730
                                          ;2731
                                          ;2732    ;////////////////////////////////////////////////////////////////////////
                                          ;2733    ;+
                                          ;2734    ; UCCK FIELD = 3, CHECK THE C AND V BIT
                                          ;2735    ;-
                                          ;2736
U 1087, 0018,0038,0980,09E0,0000,1088    ;2737    T140S3: RC[0C]_K[.2]                     ; SET THE LOOP COUNT
U 1088, 0000,003D,0180,0800,0000,11BF    ;2738    =0      SUBTEST
U 1089, 0018,0038,0580,09F0,0000,108A    ;2739            RC[0E]_K[.1]                     ; SET THE EXPECTED DATA
U 108A, 0000,003D,0180,0800,0000,11A5    ;2740    =0      ERLOOP
U 108B, 0810,0038,0180,0970,0000,1299    ;2741    T140L4: D_RC[0E]                         ; GET THE EXPECTED DATA
U 1299, 0000,003C,3D80,3C00,0000,129A    ;2742            ID[PSL]_D                        ; LOAD C AND V
U 129A, 0000,003C,0180,0800,0030,129B    ;2743    SYNC05: SET.N.AND.Z                      ; EXECUTE THE TEST INSTRUCTION
U 129B, 0000,003C,3DF0,2C00,0000,129C    ;2744            Q_ID[PSL]                        ; READ THE CC'S
U 129C, 0019,2034,0DC0,0800,0000,129D    ;2745            Q_Q.AND.K[.3]                    ; MASK THE C AND V BIT
U 129D, 001D,A000,0180,0800,0010,129E    ;2746            A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 129E, 0000,013C,0180,0800,0000,108C    ;2747            Z?
U 108C, 0001,203D,0180,09E8,0000,11A8    ;2748    =0      ERROR2,RC[0D]_Q
U 108D, 0018,0038,0980,09F0,0000,129F    ;2749            RC[0E]_K[.2]                     ; SET COMPLIMENT DATA
U 129F, 0810,0038,0180,0960,0000,12A0    ;2750            D_RC[0C]                         ; GET THE LOOP COUNT
U 12A0, 0019,8000,0580,09E0,0010,12A1    ;2751            R[0C]_D-K[.1],CLK.UBCC,BYTE      ; DECREMENT THE LOOP COUNT
U 12A1, 0000,013C,0180,0800,0000,108E    ;2752            Z?
U 108E, 0000,003C,0180,0800,0000,108B    ;2753    =0      J/T140L4                         ; CONTINUE
                                          ;2754
                                          ;2755
                                          ;2756    ;////////////////////////////////////////////////////////////////////////
                                          ;2757    ;+
                                          ;2758    ; UCCK FIELD = 5, CHECK THE C AND V BIT
                                          ;2759    ;-
                                          ;2760
U 108F, 0003,003C,0180,09F0,0000,1090    ;2761    T140S4: RC[0E]_0                         ; SET THE EXPECTED CC'S
U 1090, 0000,003D,0980,0800,0084,71C1    ;2762    =0      SETRCF[.2]
```

```
U 1091, 0000,003C,0180,0800,0000,1092   ;2763                NOP
U 1092, 0000,003D,0180,0800,0000,11BF   ;2764   =0           SUBTEST
U 1093, 0000,003C,0180,0800,0000,1094   ;2765                NOP
U 1094, 0000,003D,0180,0800,0000,11A5   ;2766   =0           ERLOOP
U 1095, 0818,0038,0980,0800,0000,12A2   ;2767                D_K[.2]                         ; INIT THE CC'S
U 12A2, 0000,003C,3D80,3C00,0000,12A3   ;2768                ID[PSL]_D                       ; INIT CC'S
U 12A3, 0810,0038,0180,0970,0050,12A4   ;2769   SYNC06:      D_RC[OE],SET.N&Z                ; EXECUTE TEST INSTRUCTION
U 12A4, 0000,003C,3DF0,2C00,0000,12A5   ;2770                Q_ID[PSL]                       ; GET C AND V
U 12A5, 0019,2034,0DC0,0800,0000,12A6   ;2771                Q_Q.AND.K[.3]                   ; MASK
U 12A6, 001D,A000,0180,0800,0010,12A7   ;2772                ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 12A7, 0000,013C,0180,0800,0000,1096   ;2773                Z?
U 1096, 0001,203D,0180,09E8,0000,11A8   ;2774   =0           ERROR2,RC[OD]_Q
U 1097, 0000,003C,0180,0800,0000,1098   ;2775                NOP
U 1098, 0000,003D,0180,0800,0000,11A5   ;2776   =0           ERLOOP
U 1099, 0818,0038,0580,0800,0000,12A8   ;2777                D_K[.1]                         ; INIT CC'S
U 12A8, 0000,003C,3D80,3C00,0000,12A9   ;2778                ID[PSL]_D                       ; ...
                                        ;2779   ;SYNC06:
U 12A9, 0810,0038,0180,0970,0050,12AB   ;2780                D_RC[OE],SET.N&Z                ; EXECUTE TEST INSTRUCTION
U 12AB, 0000,003C,3DF0,2C00,0000,12AC   ;2781                Q_ID[PSL]                       ; READ C AND V
U 12AC, 0019,2034,0DC0,0800,0000,12AD   ;2782                Q_Q.AND.K[.3]                   ; MASK
U 12AD, 001D,A000,0180,0800,0010,12AE   ;2783                ALU_Q-D,CLK.UBCC,BYTE           ; OK?
U 12AE, 0000,013C,0180,0800,0000,109A   ;2784                Z?
U 109A, 0001,203D,0180,09E8,0000,11A8   ;2785   =0           ERROR2,RC[OD]_Q
                                        ;2786
                                        ;2787
                                        ;2788   ;//////////////////////////////////////////////////////////////////////
                                        ;2789   ;+
                                        ;2790   ; UCCK FIELD = 6, CHECK THE C AND V BIT
                                        ;2791   ;-
                                        ;2792
U 109B, 0018,0038,0580,09F0,0000,109C   ;2793   T140S5: RC[OE]_K[.1]                         ; SET EXPECTED CC'S
U 109C, 0000,003D,0180,0800,0000,11BF   ;2794   =0           SUBTEST
U 109D, 0000,003C,0180,0800,0000,109E   ;2795                NOP
U 109E, 0000,003D,0180,0800,0000,11A5   ;2796   =0           ERLOOP
U 109F, 0810,0038,0180,0970,0000,12AF   ;2797                D_RC[OE]                        ; INIT THE CC'S
U 12AF, 0000,003C,3D80,3C00,0000,12B0   ;2798                ID[PSL]_D                       ; ...
U 12B0, 0000,003C,0180,0800,0060,12B1   ;2799   SYNC07:      SET.PSL.C(AMX)                  ; EXECUTE THE TEST INSTRUCTION
U 12B1, 0000,003C,3DF0,2C00,0000,12B2   ;2800                Q_ID[PSL]                       ; GET C AND V
U 12B2, 0019,2034,0DC0,0800,0000,12B3   ;2801                Q_Q.AND.K[.3]                   ; MASK
U 12B3, 001D,A000,0180,0800,0010,12B4   ;2802                ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 12B4, 0000,013C,0180,0800,0000,10A0   ;2803                Z?
U 10A0, 0001,203D,0180,09E8,0000,11A8   ;2804   =0           ERROR2,RC[OD]_Q
U 10A1, 0018,0038,0980,09F0,0000,10A2   ;2805                RC[OE]_K[.2]                    ; SET EXPECTED VALUE
U 10A2, 0000,003D,0180,0800,0000,11A5   ;2806   =0           ERLOOP
U 10A3, 0810,0038,0180,0970,0000,12B5   ;2807                D_RC[OE]
U 12B5, 0000,003C,3D80,3C00,0000,12B6   ;2808                ID[PSL]_D                       ; INIT THE CC'S
                                        ;2809   ;SYNC07:
U 12B6, 0000,003C,0180,0800,0060,12B7   ;2810                SET.PSL.C(AMX)                  ; EXECUTE THE TEST INSTRUCTION
U 12B7, 0000,003C,3DF0,2C00,0000,12B8   ;2811                Q_ID[PSL]                       ; READ C AND V
U 12B8, 0019,2034,0DC0,0800,0000,12B9   ;2812                Q_Q.AND.K[.3]                   ; MASK
U 12B9, 001D,A000,0180,0800,0010,12BA   ;2813                ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 12BA, 0000,013C,0180,0800,0000,10A4   ;2814                Z?
U 10A4, 0001,203D,0180,09E8,0000,11A8   ;2815   =0           ERROR2,RC[OD]_Q
U 10A5, 0000,003C,0180,0800,0000,10A6   ;2816                NOP
                                        ;2817
```

```
;2818
```

```
                                      .PAGE  "TEST 141      CONDITION CODE LOAD = 3 (N AND Z BIT)"
                                      ;***********************************************************************
                                      ;++
                                      ; TEST  141     CONDITION CODE LOAD = 3 (N AND Z BIT)
                                      ;
                                      ; TEST DESCRIPTION
                                      ;       THIS TEST CHECKS THE N AND Z CONDITION CODES WITH A CONDITION
                                      ;       CODE LOAD OF 3. FOR THIS UCCK FIELD VALUE, THE N BIT IS SET FROM
                                      ;       THE AMUX SIGN SO THE N BIT IS CHECKED WITH DATA TYPE BYTE, WORD,
                                      ;       AND LONG.
                                      ;       THE Z BIT IS A FUNCTION OF ALU=0 AND THE CURRENT VALUE OF THE Z
                                      ;       BIT SO, IT IS CHECKED WITH THE FOLLOWING 3 CONDITIONS:
                                      ;               1) ALU=0 AND Z=1
                                      ;               2) ALU=0 AND Z=0
                                      ;               3) ALU .NE. 0 AND Z=1
                                      ;
                                      ;       SUBTST 1 - CHECK THAT THE N BIT SETS AND CLEARS WITH DATA TYPE
                                      ;                  BYTE, WORD, AND LONG.
                                      ;       SUBTST 2 - CHECK THAT THE Z BIT SETS AND CLEARS CORRECTLY.
                                      ;
                                      ; LOGIC DESCRIPTION
                                      ;       THIS TEST CHECKS THE AMX SIGN MULTIPLEXOR AND PART OF THE Z AND
                                      ;       N BIT DATA MULTIPLEXORS ON THE CEH MODULE.
                                      ;
                                      ; ERROR DESCRIPTION
                                      ;       DATA: EXPECTED CONDITION CODES
                                      ;             RECEIVED CONDITION CODES
                                      ;             LOOP COUNT
                                      ;               SUBTST 1 - INDICATES WHETHER THE N BIT SHOULD BE SET OR CLEAR.
                                      ;               SUBTST 2 - INDICATES WHICH OF THE ABOVE THREE CONDITIONS IS
                                      ;               BEING TESTED, I.E. 3=COND 1, 2=COND 2, 1=COND 3
                                      ;             DATA TYPE FLAG - 0=BYTE, 1=WORD, AND 2=LONG
                                      ;
                                      ; SYNC POINT DESCRIPTION
                                      ;       SUBTST 1 - SYNC08--LOAD THE N BIT DATA TYPE BYTE
                                      ;                  SYNC09--LOAD THE N BIT DATA TYPE WORD
                                      ;                  SYNC0A--LOAD THE N BIT DATA TYPE LONG
                                      ;       SUBTST 2 - SYNC0B--LOAD THE Z BIT
                                      ;--
                                      ;**********************************************************************
                                      =0
U 10A6, 0018,0039,1180,09F8,0000,1191 T141:   NEWTST[.4]


                                      ;/////////////////////////////////////////////////////////////////////
                                      ;+
                                      ; CHECK THE N BIT WITH DATA TYPE BYTE, WORD, AND LONG
                                      ;-

U 10A7, 0018,0038,0180,0A90,0000,10A8 T141S1: R[2]_K[.8]                     ; USED TO SET THE N BIT
U 10A8, 0000,003D,0180,0800,0000,11BF =0      SUBTEST
U 10A9, 0818,0038,3180,0800,0000,10AA         D_K[.40]                       ; GENERATE ADDRESS OF EXPECTED DATA
U 10AA, 0000,003D,0180,0800,0000,11AA =0      CALL[DC0]                      ; EQUAL 400(X)
U 10AB, 0001,003C,0180,0A80,0000,12BB         R[0]_D
U 12BB, 0003,003C,0180,09F0,0000,12BC         RC[0E]_0                       ; INIT EXPECTED DATA
```

```
U 12BC, 0018,0038,0980,09E0,0000,12BD    ;2874            RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 12BD, 0000,003C,0180,0A00,0200,12BE    ;2875   T141L1:  VA_R[0]
U 12BE, 0003,003C,0180,09D8,0000,12BF    ;2876            RC[0B]_0                        ; INIT DATA TYPE FLAG
U 12BF, 0000,003C,0180,C800,0000,12C0    ;2877            D[LONG]_CACHE.P                 ; FETCH THE AMX DATA
U 12C0, 0001,003C,0180,0A88,0000,10AC    ;2878            R[1]_D                          ; SAVE
U 10AC, 0000,003D,0180,0800,0000,11A5    ;2879   =0       ERLOOP
U 10AD, 0800,003C,0180,0A10,0000,12C1    ;2880            D_R[2]
U 12C1, 0000,003C,3D80,3C00,0000,12C2    ;2881            ID[PSL]_D                       ; INIT THE N BIT
U 12C2, 0810,0038,0180,0970,0000,12C3    ;2882            D_RC[0E]                        ; GET EXPECTED DATA
U 12C3, 0000,803C,0180,0A08,0030,12C5    ;2883   SYNC08:  A[U_R[1],SET.N.AND.Z,BYTE       ; EXECUTE THE TEST INSTRUCTION
U 12C5, 0000,003C,3DF0,2C00,0000,12C6    ;2884            Q_ID[PSL]                       ; GET THE N BIT
U 12C6, 0019,2034,01C0,0800,0000,12C7    ;2885            Q_Q.AND.K[.8]                   ; MASK IT
U 12C7, 001D,A000,0180,0800,0010,12C8    ;2886            A[U_Q-D,CLK.UBCC,BYTE           ; N BIT OK?
U 12C8, 0000,013C,0180,0800,0000,10AE    ;2887            Z?
U 10AE, 0001,203D,0180,09E8,0000,11A8    ;2888   =0       ERROR2,RC[0D]_Q
U 10AF, 0000,003C,0180,0A00,0000,12C9    ;2889            LAB_R[0]
U 12C9, 0018,0014,1180,0800,0200,12CA    ;2890            VA_[A+K[.4]
U 12CA, 0000,003C,0180,C800,0C00,12CB    ;2891            D[LONG]_CACHE.P                 ; GET AMX DATA FOR DT/WORD
U 12CB, 0018,0038,0580,09D8,0000,12CC    ;2892            RC[0B]_K[.1]                    ; SET THE DATA TYPE FLAG
U 12CC, 0001,003C,0180,0A88,0000,10B0    ;2893            R[1]_D                          ; SAVE
U 10B0, 0000,003D,0180,0800,0000,11A5    ;2894   =0       ERLOOP
U 10B1, 0800,003C,0180,0A10,0000,12CD    ;2895            D_R[2]                          ; GET INIT VALUE FOR N BIT
U 12CD, 0000,003C,3D80,3C00,0000,12CE    ;2896            ID[PSL]_D                       ; INIT THE N BIT
U 12CE, 0810,0038,0180,0970,0000,12CF    ;2897            D_RC[0E]                        ; GET THE EXPECTED VALUE
U 12CF, 0000,403C,0180,0A08,0030,12D0    ;2898   SYNC09:  A[U_R[1],SET.N.AND.Z,WORD       ; EXECUTE THE TEST INSTRUCTION
U 12D0, 0000,003C,3DF0,2C00,0000,12D1    ;2899            Q_ID[PSL]                       ; GET THE N BIT
U 12D1, 0019,2034,01C0,0800,0000,12D2    ;2900            Q_Q.AND.K[.8]                   ; MASK THE N BIT
U 12D2, 001D,A000,0180,0800,0010,12D3    ;2901            A[U_Q-D,CLK.UBCC,BYTE           ; OK?
U 12D3, 0000,013C,0180,0800,0000,10B2    ;2902            Z?
U 10B2, 0001,203D,0180,09E8,0000,11A8    ;2903   =0       ERROR2,RC[0D]_Q
U 10B3, 0000,003C,0180,0A00,0000,12D4    ;2904            LAB_R[0]
U 12D4, 0018,0014,0180,0800,0200,12D5    ;2905            VA_[A+K[.8]
U 12D5, 0000,003C,0180,C800,0000,12D6    ;2906            D[LONG]_CACHE.P                 ; FETCH AMX DATA FOR DT/LONG
U 12D6, 0018,0038,0980,09D8,0000,12D7    ;2907            RC[0B]_K[.2]                    ; SET THE DATA TYPE FLAG
U 12D7, 0001,003C,0180,0A88,0000,10B4    ;2908            R[1]_D                          ; SAVE
U 10B4, 0000,003D,0180,0800,0000,11A5    ;2909   =0       ERLOOP
U 10B5, 0800,003C,0180,0A10,0000,12D8    ;2910            D_R[2]                          ; GET DATA TO INIT N BIT
U 12D8, 0000,003C,3D80,3C00,0000,12D9    ;2911            ID[PSL]_D                       ; INIT THE N BIT
U 12D9, 0810,0038,0180,0970,0000,12DA    ;2912            D_RC[0E]                        ; GET EXPECTED VALUE OF N BIT
U 12DA, 0000,003C,0180,0A08,0030,12DB    ;2913   SYNC0A:  A[U_R[1],SET.N.AND.Z,LONG       ; EXECUTE THE TEST INSTRUCTION
U 12DB, 0000,003C,3DF0,2C00,0000,12DC    ;2914            Q_ID[PSL]                       ; GET THE N BIT
U 12DC, 0019,2034,01C0,0800,0000,12DD    ;2915            Q_Q.AND.K[.8]                   ; MASK THE N BIT
U 12DD, 001D,A000,0180,0800,0010,12DE    ;2916            A[U_Q-D,CLK.UBCC,BYTE           ; N BIT OK?
U 12DE, 0000,013C,0180,0800,0000,10B6    ;2917            Z?
U 10B6, 0001,203D,0180,09E8,0000,11A8    ;2918   =0       ERROR2,RC[0D]_Q
U 10B7, 0000,003C,8580,0A00,0000,12DF    ;2919            LAB_R[0],KMX/.C                 ; GET ADDRESS OF AMX DATA
U 12DF, 0018,0014,8580,0A80,0000,12E0    ;2920            R[0]_LA+K[.C]                   ; SET TO ADDRESS OF DATA TO SET N BIT
U 12E0, 0018,0038,0180,09F0,0000,12E1    ;2921            RC[0E]_K[.8]                    ; SET EXPECTED VALUE OF N BIT
U 12E1, 0003,003C,0180,0A90,0000,12E2    ;2922            R[2]_0                          ; SET INIT VALUE OF N BIT
U 12E2, 0810,0038,0180,0960,0000,12E3    ;2923            D_RC[0C]
U 12E3, 0019,8000,0580,09E0,0010,12E4    ;2924            RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT THE LOOP COUNT
U 12E4, 0000,013C,0180,0800,0000,10B8    ;2925            Z?
U 10B8, 0000,003C,0180,0800,0000,12BD    ;2926   =0       J/T141L1
                                         ;2927
                                         ;2928
```

```
                                                  ;2929    ;//////////////////////////////////////////////////////////////////////
                                                  ;2930    ;+
                                                  ;2931    ; UCCK FIELD=3, CHECK THE Z BIT
                                                  ;2932    ;-
                                                  ;2933
U 10B9, 0018,0038,0D80,09E0,0000,10BA            ;2934    T141S2: RC[OC]_K[.3]                    ; SET THE LOOP COUNT
U 10BA, 0003,003D,0180,0A80,0000,11BF            ;2935    =0      SUBTEST,R[0]_0
U 10BB, 0018,0038,1180,09F0,0000,10BC            ;2936            RC[OE]_K[.4]                    ; SET EXPECTED VALUE OF Z BIT
U 10BC, 0000,003D,0D80,0800,0084,71C1            ;2937    =0      SETRCF[.3]
U 10BD, 0018,0038,1180,0A88,0000,10BE            ;2938            R[1]_K[.4]                      ; SET THE INIT VALUE OF THE Z BIT
U 10BE, 0000,003D,0180,0800,0000,11A5            ;2939    =0      ERLOOP
U 10BF, 0800,003C,0180,0A08,0000,12E5            ;2940    T141L2: D_R[1]
U 12E5, 0000,003C,3D80,3C00,0000,12E6            ;2941            ID[PSL]_D                       ; INIT THE Z BIT
U 12E6, 0810,0038,0180,0970,0000,12E7            ;2942            D_RC[OE]                        ; GET EXPECTED VALUE OF Z BIT
U 12E7, 0000,003C,0180,0A00,0030,12E8            ;2943    SYNC08: A[U_R[0],SET.N.AND.Z            ; EXECUTE THE TEST INSTRUCTION
U 12E8, 0000,003C,3DF0,2C00,0000,12E9            ;2944            Q_ID[PSL]                       ; GET THE Z BIT
U 12E9, 0019,2034,11C0,0800,0000,12EA            ;2945            Q_Q.AND.K[.4]                   ; MASK IT
U 12EA, 001D,A000,0180,0800,0010,12EB            ;2946            A[U_Q-D,CLK.UBCC,BYTE           ; CHECK
U 12EB, 0000,013C,0180,0800,0000,10C0            ;2947            Z?
U 10C0, 0001,203D,0180,09E8,0000,11A8            ;2948    =0      ERROR2,RC[OD]_Q
U 10C1, 0003,003C,0180,09F0,0000,12EC            ;2949            RC[OE]_0                        ; SET THE NEXT EXPECTED VALUE
U 12EC, 0003,003C,0180,0A88,0000,12ED            ;2950            R[1]_0                          ; SET THE NEXT INIT VALUE
U 12ED, 0810,0038,0180,0960,0000,12EE            ;2951            D_RC[OC]                        ; GET THE LOOP COUNT
U 12EE, 0019,8000,0980,0800,0010,12EF            ;2952            A[U_D-K[.2],CLK.UBCC,BYTE       ; LOOP COUNT AT 2 YET?
U 12EF, 0000,013C,0180,0800,0000,10C2            ;2953            Z?                              ; BRANCH IF YES
U 10C2, 0000,003C,0180,0800,0000,12F1            ;2954    =0      J/T141P1                        ; CONTINUE
U 10C3, 0018,0038,0580,0A80,0000,12F0            ;2955            R[0]_K[.1]                      ; SET THE INIT Z DATA FOR THE LAST LOOP
U 12F0, 0018,0038,1180,0A88,0000,12F1            ;2956            R[1]_K[.4]                      ; AND THE ALU DATA
U 12F1, 0019,8000,0580,09E0,0010,12F2            ;2957    T141P1: RC[OC]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT THE LOOP COUNT
U 12F2, 0000,013C,0180,0800,0000,10C4            ;2958            Z?
U 10C4, 0000,003C,0180,0800,0000,10BF            ;2959    =0      J/T141L2
U 10C5, 0000,003C,0180,0800,0000,10C6            ;2960            NOP
                                                  ;2961
                                                  ;2962
                                                  ;2963    ; THE FOLLOWING IS THE AMX DATA FOR THE ABOVE TEST (SUBTEST 1):
                                                  ;2964    ;% 400
                                                  ;2965    ; LOOP COUNT =2, DATA TYPE BYTE
                                                  ;2966    ;$ 8000,8000
                                                  ;2967    ; LOOP COUNT =2, DATA TYPE WORD
                                                  ;2968    ;$ 0080,8000
                                                  ;2969    ; LOOP COUNT =2, DATA TYPE LONG
                                                  ;2970    ;$ 8080,0000
                                                  ;2971    ; LOOP COUNT =1, DATA TYPE BYTE
                                                  ;2972    ;$ 0080,0000
                                                  ;2973    ; LOOP COUNT =1, DATA TYPE WORD
                                                  ;2974    ;$ 8000,0000
                                                  ;2975    ; LOOP COUNT =1, DATA TYPE LONG
                                                  ;2976    ;$ 0000,8000
                                                  ;2977
                                                  ;2978
```

```
                                         .PAGE   "TEST 142       CONDITION CODE LOAD = 5 & 6 (N AND Z BIT)"
                                         ;*********************************************************************
                                         ;++
                                         ; TEST  142     CONDITION CODE LOAD = 5 & 6(N AND Z BIT)
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS TEST CHECKS THE N AND Z BITS WITH A CONDITION CODE LOAD
                                         ;       FUNCTION = 5 AND 6. THE Z BIT IS A FUNCTION OF ALU=0 FOR BOTH
                                         ;       OF THE CODITION CODE LOADS, SO IT IS TESTED WITH ALU=0
                                         ;       AND ALU .NE. 0.
                                         ;       THE N BIT IS A FUNCTION OF THE INVERTED ALU SIGN
                                         ;       XOR'D WITH THE SIGNAL "INV ALU SIGN" FROM A ROM. THE INV ALU SIGN
                                         ;       SIGNAL IS ALWAYS LOW (FOR UCCK 5 & 6) SO THE N BIT BECOMES A
                                         ;       FUNCTION OF THE INVERTED ALU SIGN ONLY. THIS TEST THEN CHECKS THE
                                         ;       N BIT WITH THE ALU SIGN = TO 0 AND 1. SINCE THE ALU SIGN
                                         ;;      IS A FUNCTION OF THE DATA TYPE, DATA TYPES BYTE, WORD, AND
                                         ;       LONG ARE TESTED. THE ALU DATA IS FETCHED FROM THE CACHE AND IS THE SAME
                                         ;       AS THE DATA USED IN THE PREVIOUS TEST.
                                         ;
                                         ;       SUBTST 1 - CHECK THE Z BIT
                                         ;       SUBTST 2 - CHECK THE N BIT
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;       THIS TEST CHECKS THE MULTIPLEXORS AND ASSOCIATED COMBINATIONAL LOGIC
                                         ;       THAT FEED THE N AND Z DATA SIGNALS ON THE CEH MODULE, FOR CONDITION
                                         ;       CODE LOAD FUNCTIONS OF 5 AND 6.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       DATA: EXPECTED CONDITION CODES
                                         ;             RECEIVED CONDITION CODES
                                         ;             LOOP COUNT - 2=N BIT SHOULD BE CLEAR, 1=N BIT SHOULD BE SET
                                         ;             DATA TYPE FLAG - 0=BYTE, 1=WORD, AND 2=LONG
                                         ;
                                         ; SYNC POINT DESCRIPTION
                                         ;       SUBTST 1 - SYNC0C--TRY AND CLEAR THE Z BIT, USSC=5
                                         ;                  SYNCAD--TRY AND SET THE Z BIT, UCCK=5
                                         ;                  SYNCAE--TRY AND SET THE Z BIT, UCCK=6
                                         ;                  SYNCAF--TRY AND CLEAR THE Z BIT, UCCK=6
                                         ;       SUBTST 2 - SYNCA0--CLOCK THE N BIT, UCCK=5, DATA TYPE BYTE
                                         ;                  SYNCA1--CLOCK THE N BIT, UCCK=6, DATA TYPE BYTE
                                         ;                  SYNC12--CLOCK THE N BIT, UCCK=5, DATA TYPE WORD
                                         ;                  SYNC13--CLOCK THE N BIT, UCCK=5, DATA TYPE LONG
                                         ;--
                                         ;*********************************************************************
                                         =0
U 10C6, 0018,0039,0980,09F8,0000,1191    T142:   NEWTST[.2]
U 10C7, 0003,003C,0180,09F0,0000,10C8            RC[0E]_0                         ; SET EXPECTED RESULT

                                         ;/////////////////////////////////////////////////////////////////////
                                         ;+
                                         ; UCCK FIELD =5, CHECK THE Z BIT
                                         ;-

                                         =0
U 10C8, 0000,003D,0180,0800,0000,118F    T142S1: SUBTEST
```

```
U 10C9, 0000,003C,0180,0800,0000,10CA     ;3034                NOP
U 10CA, 0000,003D,0180,0800,0000,11A5     ;3035     =0         ERLOOP
U 10CB, 0818,0038,1180,0800,0000,12F3     ;3036                D_K[.4]                          ; INIT THE Z BIT
U 12F3, 0000,003C,3D80,3C00,0000,12F4     ;3037                ID[PSL]_D                        ; ...
U 12F4, 0810,0038,0180,0970,0000,12F5     ;3038                D_RC[0E]                         ; GET THE EXPECTED DATA
U 12F5, 0018,0038,0580,0800,0050,12F6     ;3039     SYNC0C:    A[U_K[.1],SET.N&Z                ; EXECUTE THE TEST INSTRUCTION
U 12F6, 0000,003C,3DF0,2C00,0000,12F7     ;3040                Q_ID[PSL]                        ; GET THE Z BIT
U 12F7, 0019,2034,11C0,0800,0000,12F8     ;3041                Q_Q.AND.K[.4]                    ; MASK
U 12F8, 001D,A000,0180,0800,0010,12F9     ;3042                A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 12F9, 0000,013C,0180,0800,0000,10CC     ;3043                Z?
U 10CC, 0001,203D,0180,09E8,0000,11A8     ;3044     =0         ERROR2,RC[0D]_Q
                                          ;3045
                                          ;3046     ;+
                                          ;3047     ; CHECK THAT Z BIT CLEARS WITH UCCK=6
                                          ;3048     ;-
                                          ;3049
U 10CD, 0000,003C,0180,0800,0000,10CE     ;3050                NOP
U 10CE, 0000,003D,0180,0800,0000,11A5     ;3051     =0         ERLOOP
U 10CF, 0818,0038,1180,0800,0000,12FA     ;3052                D_K[.4]
U 12FA, 0000,003C,3D80,3C00,0000,12FB     ;3053                ID[PSL]_D                        ; INIT THE CC'S
U 12FB, 0810,0038,0180,0970,0000,12FC     ;3054                D_RC[0E]                         ; GET EXPECTED VALUE
U 12FC, 0018,0038,0580,0800,0060,12FD     ;3055     SYNCAD:    A[U_K[.1],SET.PSL.C(AMX)         ; EXECUTE THE TEST INSTRUCTION
U 12FD, 0000,003C,3DF0,2C00,0000,12FE     ;3056                Q_ID[PSL]                        ; GET THE Z BIT
U 12FE, 0019,2034,11C0,0800,0000,12FF     ;3057                Q_Q.AND.K[.4]                    ; MASK
U 12FF, 001D,A000,0180,0800,0010,1300     ;3058                A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 1300, 0000,013C,0180,0800,0000,10D0     ;3059                Z?
U 10D0, 0001,203D,0180,09E8,0000,11A8     ;3060     =0         ERROR2,RC[0D]_Q
                                          ;3061
                                          ;3062     ;+
                                          ;3063     ; CHECK THAT Z BIT SETS WITH UCCK=5
                                          ;3064     ;-
                                          ;3065
                                          ;3066
                                          ;3067     ;+
                                          ;3068     ; UCCK FIELD = 6, CHECK THE Z BIT
                                          ;3069     ;-
                                          ;3070
U 10D1, 0018,0038,1180,09F0,0000,10D2     ;3071                RC[0E]_K[.4]                     ; INIT EXPECTED DATA
U 10D2, 0000,003D,0180,0800,0000,11A5     ;3072     =0         ERLOOP
U 10D3, 0F00,003C,0180,0800,0000,1301     ;3073                D_0
U 1301, 0000,003C,3D80,3C00,0000,1302     ;3074                ID[PSL]_D                        ; INIT THE Z BIT
U 1302, 0810,0038,0180,0970,0000,1303     ;3075                D_RC[0E]                         ; GET EXPECTED DATA
U 1303, 0003,003C,0180,0800,0050,1304     ;3076     SYNCAE:    A[U_0(A),SET.N&Z                 ; EXECUTE THE TEST INSTRUCTION
U 1304, 0000,003C,3DF0,2C00,0000,1305     ;3077                Q_ID[PSL]                        ; GET THE Z BIT
U 1305, 0019,2034,11C0,0800,0000,1306     ;3078                Q_Q.AND.K[.4]                    ; MASK
U 1306, 001D,A000,0180,0800,0010,1307     ;3079                A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 1307, 0000,013C,0180,0800,0000,10D4     ;3080                Z?
U 10D4, 0001,203D,0180,09E8,0000,11A8     ;3081     =0         ERROR2,RC[0D]_Q
                                          ;3082
                                          ;3083     ;+
                                          ;3084     ; CHECK THAT THE Z BIT SETS WITH UCCK=6
                                          ;3085     ;-
                                          ;3086
U 10D5, 0000,003C,0180,0800,0000,10D6     ;3087                NOP
U 10D6, 0000,003D,0180,0800,0000,11A5     ;3088     =0         ERLOOP
```

```
U 10D7, 0810,0038,0160,0970,0000,1308   ;3089           D_RC[0E]
U 1308, 0000,003C,3D80,3C00,0000,1309   ;3090           ID[PSL]_D                       ; INIT THE CC'S
U 1309, 0810,0038,0180,0970,0000,130A   ;3091           D_RC[0E]
U 130A, 0003,003C,0180,0800,0060,130B   ;3092   SYNCAF: A[U_0(A),SET.PSL.C(AMX)         ; EXECUTE THE TEST INSTRUCTION
U 130B, 0000,003C,3DF0,2C00,0000,130C   ;3093           Q_ID[PSL]
U 130C, 0019,2034,11C0,0800,0000,130D   ;3094           Q_Q.AND.K[.4]                   ; READ AND MASK THE Z BIT
U 130D, 001D,A000,0180,0800,0010,130E   ;3095           A[U_Q-D,CLK.UBCC,BYTE           ; CHECK
U 130E, 0000,013C,0180,0800,0000,10D8   ;3096           Z?
U 10D8, 0001,203D,0180,09E8,0000,11A8   ;3097   =0      ERROR2,RC[0D]_Q
                                        ;3098
                                        ;3099
                                        ;3100   ;///////////////////////////////////////////////////////////////////////
                                        ;3101   ;+
                                        ;3102   ; UCCK FIELD = 5 AND 6, N BIT DATA TYPE BYTE, WORD, AND LONG
                                        ;3103   ;-
                                        ;3104
U 10D9, 0018,0038,0180,0A90,0000,10DA   ;3105   T142S2: R[2]_K[.8]                      ; USED TO SET THE N BIT
U 10DA, 0000,003D,0180,0800,0000,11BF   ;3106   =0      SUBTEST
U 10DB, 0818,0038,3180,0800,0000,10DC   ;3107           D_K[.40]                        ; GENERATE ADDRESS OF BMX DATA
U 10DC, 0000,003D,0180,0800,0000,11AA   ;3108   =0      CALL[DC0]                       ; EQUAL 400(X)
U 10DD, 0001,003C,0180,0A80,0000,130F   ;3109           R[0]_D
U 130F, 0003,003C,0180,09F0,0000,10DE   ;3110           RC[0E]_0                        ; INIT EXPECTED DATA
U 10DE, 0000,003D,1180,0800,0084,71C1   ;3111   =0      SETRCF[.4]
U 10DF, 0018,0038,0980,09E0,0000,1310   ;3112           RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 1310, 0000,003C,0180,0A00,0200,1311   ;3113   T142L1: VA_R[0]
U 1311, 0000,003C,0180,C800,0000,1312   ;3114           D[[ONG]_CACHE.P                 ; FETCH THE BMX DATA
U 1312, 0001,003C,0180,0988,0000,1313   ;3115           RC[1]_D                         ; SAVE
U 1313, 0003,003C,0180,09D8,0000,10E0   ;3116           RC[0B]_0                        ; SET THE DATA TYPE FLAG
U 10E0, 0000,003D,0180,0800,0000,11A5   ;3117   =0      ERLOOP
U 10E1, 0800,003C,0180,0A10,0000,1314   ;3118           D_R[2]
U 1314, 0000,003C,3D80,3C00,0000,1315   ;3119           ID[PSL]_D                       ; INIT THE N BIT
U 1315, 0810,0038,0180,0970,0000,1316   ;3120           D_RC[0E]                        ; GET EXPECTED DATA
U 1316, 0010,8038,0180,0908,0050,1317   ;3121   SYNCA0: A[U_RC[1],SET.N&Z,BYTE          ; EXECUTE THE TEST INSTRUCTION
U 1317, 0000,003C,3DF0,2C00,0000,1318   ;3122           Q_ID[PSL]                       ; GET THE N BIT
U 1318, 0019,2034,01C0,0800,0000,1319   ;3123           Q_Q.AND.K[.8]                   ; MASK IT
U 1319, 001D,A000,0180,0800,0010,131A   ;3124           A[U_Q-D,CLK.UBCC,BYTE           ; N BIT OK?
U 131A, 0000,013C,0180,0800,0000,10E2   ;3125           Z?
U 10E2, 0001,203D,0180,09E8,0000,11A8   ;3126   =0      ERROR2,RC[0D]_Q
                                        ;3127
                                        ;3128   ;+
                                        ;3129   ; CHECK THAT N BIT CLEARS AND SETS WITH UCCK=6
                                        ;3130   ; NOTE: ONLY HAVE TO CHECK ONE OF THE DATA TYPES.
                                        ;3131   ;-
                                        ;3132
U 10E3, 0000,003C,0180,0800,0000,131B   ;3133           NOP
U 131B, 0018,0038,0580,09D8,0000,10E4   ;3134           RC[0B]_K[.1]                    ; SET THE DATA TYPE FLAG
U 10E4, 0000,003D,0180,0800,0000,11A5   ;3135   =0      ERLOOP
U 10E5, 0800,003C,0180,0A10,0000,131C   ;3136           D_R[2]
U 131C, 0000,003C,3D80,3C00,0000,131D   ;3137           ID[PSL]_D                       ; INIT THE N BIT
U 131D, 0810,0038,0180,0970,0000,131E   ;3138           D_RC[0E]                        ; GET EXPECTED DATA
U 131E, 0010,8038,0180,0908,0060,131F   ;3139   SYNCA1: A[U_RC[1],SET.PSL.C(AMX),BYTE   ; EXECUTE THE TEST
U 131F, 0000,003C,3DF0,2C00,0000,1320   ;3140           Q_ID[PSL]                       ; READ THE N BIT
U 1320, 0019,2034,01C0,0800,0000,1321   ;3141           Q_Q.AND.K[.8]                   ; MASK
U 1321, 001D,A000,0180,0800,0010,1322   ;3142           A[U_Q-D,CLK.UBCC,BYTE           ; CHECK
U 1322, 0000,013C,0180,0800,0000,10E6   ;3143           Z?
```

```
U 10E6, 0001,203D,0180,09E8,0000,11A8   ;3144   =0      ERROR2,RC[0D]_Q                  ; N BIT FAILED
                                        ;3145
                                        ;3146   ;+
                                        ;3147   ; CHECK THAT THE N BIT CLEARS AND SETS WITH DATA TYPE WORD
                                        ;3148   ;-
                                        ;3149
U 10E7, 0000,003C,0180,0A00,0000,1323   ;3150           LAB_R[0]
U 1323, 0018,0014,1180,0800,0200,1324   ;3151           VA_[A+K[.4]
U 1324, 0000,003C,0180,C800,0000,1325   ;3152           D[LONG]_CACHE.P                  ; GET BMX DATA FOR DT/WORD
U 1325, 0001,003C,0180,0988,0000,1326   ;3153           RC[1]_D                          ; SAVE
U 1326, 0018,0038,0980,09D8,0000,10E8   ;3154           RC[0B]_K[.2]                     ; SET THE DATA TYPE FLAG
U 10E8, 0000,003D,0180,0800,0000,11A5   ;3155   =0      ERLOOP
U 10E9, 0800,003C,0180,0A10,0000,1327   ;3156           D_R[2]                           ; GET INIT VALUE FOR N BIT
U 1327, 0000,003C,3D80,3C00,0000,1328   ;3157           ID[PSL]_D                        ; INIT THE N BIT
U 1328, 0810,0038,0180,0970,0000,1329   ;3158           D_RC[0E]                         ; GET THE EXPECTED VALUE
U 1329, 0010,4038,0180,0908,0050,132A   ;3159   SYNC12: A[U_RC[1],SET.N&Z,WORD           ; EXECUTE THE TEST INSTRUCTION
U 132A, 0000,003C,3DF0,2C00,0000,132B   ;3160           Q_ID[PSL]                        ; GET THE N BIT
U 132B, 0019,2034,01C0,0800,0000,132C   ;3161           Q_Q.AND.K[.8]                    ; MASK THE N BIT
U 132C, 001D,A000,0180,0800,0010,132D   ;3162           A[U_Q-D,CLK.UBCC,BYTE            ; OK?
U 132D, 0000,013C,0180,0800,0000,10EA   ;3163           Z?
U 10EA, 0001,203D,0180,09E8,0000,11A8   ;3164   =0      ERROR2,RC[0D]_Q
                                        ;3165
                                        ;3166   ;+
                                        ;3167   ; CHECK THAT THE N BIT CLEARS AND SETS WITH DATA TYPE LONG
                                        ;3168   ;-
                                        ;3169
U 10EB, 0000,003C,0180,0A00,0000,132E   ;3170           LAB_R[0]
U 132E, 0018,0014,0180,0800,0200,132F   ;3171           VA_[A+K[.8]
U 132F, 0000,003C,0180,C800,0000,1330   ;3172           D[LONG]_CACHE.P                  ; FETCH BMX DATA FOR DT/LONG
U 1330, 0001,003C,0180,0988,0000,10EC   ;3173           RC[1]_D                          ; SAVE
U 10EC, 0000,003D,0180,0800,0000,11A5   ;3174   =0      ERLOOP
U 10ED, 0800,003C,0180,0A10,0000,1331   ;3175           D_R[2]                           ; GET DATA TO INIT N BIT
U 1331, 0000,003C,3D80,3C00,0000,1332   ;3176           ID[PSL]_D                        ; INIT THE N BIT
U 1332, 0810,0038,0180,0970,0000,1333   ;3177           D_RC[0E]                         ; GET EXPECTED VALUE OF N BIT
U 1333, 0010,0038,0180,0908,0050,1334   ;3178   SYNC13: A[U_RC[1],SET.N&Z,LONG           ; EXECUTE THE TEST INSTRUCTION
U 1334, 0000,003C,3DF0,2C00,0000,1335   ;3179           Q_ID[PSL]                        ; GET THE N BIT
U 1335, 0019,2034,01C0,0800,0000,1336   ;3180           Q_Q.AND.K[.8]                    ; MASK THE N BIT
U 1336, 001D,A000,0180,0800,0010,1337   ;3181           A[U_Q-D,CLK.UBCC,BYTE            ; N BIT OK?
U 1337, 0000,013C,0180,0800,0000,10EE   ;3182           Z?
U 10EE, 0001,203D,0180,09E8,0000,11A8   ;3183   =0      ERROR2,RC[[illegible]]_[illegible]
U 10EF, 0000,003C,8580,0A00,0000,1338   ;3184           LAB_R[0],KMX/.C                  ; GET ADDRESS OF BMX DATA
                                        ;3185
                                        ;3186   ;+
                                        ;3187   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3188   ;-
                                        ;3189
U 1338, 0018,0014,8580,0A80,0000,1339   ;3190           R[0]_LA+K[.C]                    ; SET TO ADDRESS OF DATA TO SET N BIT
U 1339, 0018,0038,0180,09F0,0000,133A   ;3191           RC[0E]_K[.8]                     ; SET EXPECTED VALUE OF N BIT
U 133A, 0003,003C,0180,0A90,0000,133B   ;3192           R[2]_0                           ; SET INIT VALUE OF N BIT
U 133B, 0810,0038,0180,0960,0000,133C   ;3193           D_RC[0C]
U 133C, 0019,8000,0580,09E0,0010,133D   ;3194           RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT THE LOOP COUNT
U 133D, 0000,013C,0180,0800,0000,10F0   ;3195           Z?
U 10F0, 0000,003C,0180,0800,0000,1310   ;3196   =0      J/T142L1
U 10F1, 0000,003C,0180,0800,0000,10F2   ;3197           NOP
                                        ;3198
```

```
;3199
```

```
                                        .PAGE   "TEST 143       INSTRUCTION DEPENDENT COND CODE LOAD (C BIT)"
                                        ;****************************************************************************
                                        ;++
                                        ; TEST  143     CONDITION CODE LOAD=INSTRUCTION DEPENDENT-- C BIT
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST LOADS THE INSTRUCTION BUFFER WITH THE APPROPRIATE OP
                                        ;       CODES TO GENERATE "C SELECT" CODES OF 0, 1, 3, AND 5.
                                        ;
                                        ;       SUBTST 1 - CHECK C SELECT CODE OF 0 BY SETTING AND CLEARING THE
                                        ;                  C BIT AND ENSURING IT REMAINS UNCHANGED.
                                        ;       SUBTST 2 - CHECK C SELECT CODE OF 1 FOR DATA TYPES OF BYTE, WORD,
                                        ;                  AND LONG WITH ALU CARRY TRUE AND FALSE FOR EACH
                                        ;                  DATA TYPE.
                                        ;       SUBTST 3 - CHECK C SELECT CODE OF 3 BY SETTING THE C BIT AND
                                        ;                  ENSURING THAT IT CLEARS.
                                        ;       SUBTST 4 - CHECK C SELECT CODE OF 5 WITH ALU CARRY TRUE AND ALU
                                        ;                  CARRY FALSE.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS THE VAX CONDITION CODE INSTRUCTION DEPENDENT
                                        ;       PROM, AND THE CV SEL PROM (C SEL OUTPUTS), THE MULTIPLEXOR
                                        ;       FOR THE ALU CARRY BIT, AND PART OF THE MULTIPLEXOR FOR THE C DATA
                                        ;       SIGNAL.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED C BIT
                                        ;             RECEIVED C BIT
                                        ;             LOOP COUNT - SUBTST 2 ONLY -- INDICATES THE VALUE OF THE
                                        ;               ALU CARRY BIT, I.E. 6=FALSE & DT/BYTE, 5=FALSE & DT/WORD,
                                        ;               4=FALSE & DT/LONG, 3=TRUE & DT/BYTE, 2=TRUE & DT/WORD
                                        ;               1=TRUE & DT/LONG.
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       SUBTST 1 - SYNC14--C BIT SHOULD BE CLEAR AND STAY CLEAR
                                        ;                  SYNC15--C BIT SHOULD BE SET AND STAY SET
                                        ;       SUBTST 2 - SYNC16--C BIT GETS LOADED
                                        ;       SUBTST 3 - SYNC17--C BIT SHOULD CLEAR
                                        ;       SUBTST 4 - SYNC18--C BIT SHOULD CLEAR
                                        ;                  SYNC19--C BIT SHOULD SET
                                        ;--
                                        ;************************************************************************
                                        =0
U 10F2, 0018,0039,0980,09F8,0000,1191   T143:   NEWTST[.2]

                                        ;//////////////////////////////////////////////////////////////////////////
                                        ;+
                                        ; C SELECT<2:0>=HHH    C_PSL C
                                        ;-

U 10F3, 0003,003C,0180,09F0,0000,10F4   T143S1: RC[0E]_0                        ; INIT EXP VALUE OF C BIT
U 10F4, 0000,003D,0180,0800,0000,11BF   =0      SUBTEST
U 10F5, 0818,0038,7D80,0800,0000,133E           D_K[.18]                        ; INIT ADDRESS OF IB DATA
U 133E, 0000,003C,F580,0800,0084,733F           SC_K[.A]                        ; ...
U 133F, 0001,001C,0180,0A88,0000,10F6           R[T]_D.ORNOT.MASK               ; EQUALS 418(X)
```

```
                                           ;3255
U 10F6, 2000,003D,0180,0A08,4200,11DF      ;3256    =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10F7, 0000,003C,0180,0800,0000,10F8      ;3257            NOP
U 10F8, 0000,003D,0180,0800,0000,11A5      ;3258    =0      ERLOOP
U 10F9, 0810,0038,0180,0970,0000,1340      ;3259            D_RC[0E]                        ; GET EXPECTED VALUE
U 1340, 0000,003C,3DF0,2C00,0000,1341      ;3260            Q_ID[PSL]
U 1341, 0019,2024,61C0,0800,0000,1342      ;3261            Q_Q.ANDNOT.K[.F]
U 1342, 081D,0030,0180,0800,0000,1343      ;3262            D_D.OR.Q
U 1343, 0000,003C,3D80,3C00,0000,1344      ;3263            ID[PSL]_D                       ; LOAD THE C BIT
U 1344, 0000,C03C,0180,0800,0070,1345      ;3264    SYNC14: SET.CC(INST)                    ; EXECUTE THE INSTRUCTION UNDER TEST
U 1345, 0000,003C,3DF0,2C00,0000,1346      ;3265            Q_ID[PSL]                       ; GET THE C BIT
U 1346, 0019,2034,05C0,0800,0000,1347      ;3266            Q_Q.AND.K[.1]                   ; MASK
U 1347, 001D,A000,0180,0800,0010,1348      ;3267            ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 1348, 0000,013C,0180,0800,0000,10FA      ;3268            Z?
U 10FA, 0001,203D,0180,09E8,0000,11A8      ;3269    =0      ERROR2,RC[0D]_Q
U 10FB, 0018,0038,0580,09F0,0000,1349      ;3270            RC[0E]_K[.1]                    ; SET EXP VALUE OF C BIT
U 1349, 0810,0038,0180,0970,0000,134A      ;3271            D_RC[0E]                        ; LOAD THE C BIT
U 134A, 0000,003C,3DF0,2C00,0000,134B      ;3272            Q_ID[PSL]
U 134B, 0019,2024,61C0,0800,0000,134C      ;3273            Q_Q.ANDNOT.K[.F]
U 134C, 081D,0030,0180,0800,0000,134D      ;3274            D_D.OR.Q
U 134D, 0000,003C,3D80,3C00,0000,134E      ;3275            ID[PSL]_D                       ; ...
U 134E, 0000,C03C,0180,0800,0070,134F      ;3276    SYNC15: SET.CC(INST)                    ; EXECUTE THE TEST INSTRUCTION
U 134F, 0000,003C,3DF0,2C00,0000,1350      ;3277            Q_ID[PSL]                       ; GET THE C BIT
U 1350, 0019,2034,05C0,0800,0000,1351      ;3278            Q_Q.AND.K[.1]                   ; MASK
U 1351, 001D,A000,0180,0800,0010,1352      ;3279            ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 1352, 0000,013C,0180,0800,0000,10FC      ;3280            Z?
U 10FC, 0001,203D,0180,09E8,0000,11A8      ;3281    =0      ERROR2,RC[0D]_Q
                                           ;3282
                                           ;3283
                                           ;3284    ;////////////////////////////////////////////////////////////////////////
                                           ;3285    ;+
                                           ;3286    ; C SELECT<2:0>=HHL   C_ALU CARRY L
                                           ;3287    ;-
                                           ;3288
U 10FD, 0000,003C,0180,0800,0000,10FE      ;3289            NOP
                                           ;3290    =0
U 10FE, 0000,003D,0180,0800,0000,11BF      ;3291    T143S2: SUBTEST
U 10FF, 0000,003C,0180,0800,0000,110A      ;3292            NOP
U 110A, 0000,003D,0D80,0800,0084,71C1      ;3293    =0      SETRCF[.3]
U 110B, 0000,003C,8D80,0800,0084,7353      ;3294            SC_K[.1F]                       ; GENERATE DATA PATTERN TO
U 1353, 0803,0010,4580,0800,0000,1354      ;3295            D_MASK+1,KMX/.8000              ; CAUSE CARRYS IN ALL FOUR BYTES
U 1354, 0819,0014,4580,0800,0000,1355      ;3296            D_D+K[.8000]                    ; ...
U 1355, 0819,0030,4180,0800,0000,1356      ;3297            D_D.OR.K[.80]
U 1356, 0001,003C,F580,0990,0084,7357      ;3298            RC[2]_D,SC_K[.A]                ; SAVE IN RC 2
U 1357, 0803,001C,0180,0800,0000,1358      ;3299            D_NOT.MASK
U 1358, 0019,0030,E580,0A88,0000,1359      ;3300            R[1]_D.OR.K[.1A]                ; INIT ADR OF IB DATA
U 1359, 0019,0030,7980,0A80,0000,135A      ;3301            R[0]_D.OR.K[.30]                ; INIT ADR OF AMX DATA
U 135A, 0018,0038,0580,0A98,0000,135B      ;3302            R[3]_K[.1]                      ; VALUE TO INIT THE C BIT
U 135B, 0018,0038,D580,09E0,0000,135C      ;3303            RC[0C]_K[.6]                    ; SET THE LOOP COUNT
U 135C, 0003,003C,0180,09F0,0000,135D      ;3304            RC[0E]_0                        ; INIT EXP VALUE OF C BIT
                                           ;3305
U 135D, 0000,003C,0180,0A00,0200,135E      ;3306    T143L1: VA_R[0]
U 135E, 0000,003C,0180,C800,0000,135F      ;3307            D[LONG]_CACHE.P                 ; FETCH AMX DATA
U 135F, 0001,003C,0180,0A90,0000,1110      ;3308            R[2]_D                          ; SAVE IN R2
U 1110, 2000,003D,0180,0A08,4200,11DF      ;3309    =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
```

```
U 1111, 0000,003C,0180,0800,0000,1112    ;3310             NOP
U 1112, 0000,003D,0180,0800,0000,11C4    ;3311    =0       CALL,J/DISPAT                     ; LOAD THE DATA TYPE LATCH
U 1113, 0000,003C,0180,0800,0000,1114    ;3312             NOP
U 1114, 0000,003D,0180,0800,0000,11A5    ;3313    =0       ERLOOP
U 1115, 0800,003C,0180,0A18,0000,1360    ;3314             D_R[3]                            ; INIT THE C BIT
U 1360, 0000,003C,3DF0,2C00,0000,1361    ;3315             Q_ID[PSL]
U 1361, 0019,2024,61C0,0800,0000,1362    ;3316             Q_Q.ANDNOT.K[.F]
U 1362, 081D,0030,0180,0800,0000,1363    ;3317             D_D.OR.Q
U 1363, 0000,003C,3D80,3E10,0000,1364    ;3318             ID[PSL]_D,LAB_R[2]                ; ...
U 1364, 0810,0038,0180,0970,0000,1365    ;3319             D_RC[0E]                          ; GET EXP VALUE
U 1365, 0000,003C,0180,0910,0000,1366    ;3320             LC_RC[2]                          ; LATCH BMX DATA
U 1366, 0010,C014,0180,0800,0070,1367    ;3321    SYNC16:  ALU_LA+LC,SET.CC(INST)            ; EXECUTE TEST FUNCTION
U 1367, 0000,003C,3DF0,2C00,0000,1368    ;3322             Q_ID[PSL]                         ; GET THE C BIT
U 1368, 0019,2034,05C0,0800,0000,1369    ;3323             Q_Q.AND.K[.1]                     ; MASK
U 1369, 001D,A000,0180,0800,0010,136A    ;3324             ALU_Q-D,CLK.UBCC,BYTE             ; CHECK
U 136A, 0000,013C,0180,0800,0000,1116    ;3325             Z?
U 1116, 0001,203D,0180,09E8,0000,11A8    ;3326    =0       ERROR2,RC[0D]_Q
                                         ;3327
                                         ;3328    ;+
                                         ;3329    ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUB TEST
                                         ;3330    ;-
                                         ;3331
U 1117, 0000,003C,0180,0A00,0000,136B    ;3332             LAB_R[0]
U 136B, 0018,0014,1180,0A80,0000,136C    ;3333             R[0]_LA+K[.4]                     ; INCREMENT ADR OF AMX DATA
U 136C, 0000,003C,0180,0A08,0000,136D    ;3334             LAB_R[1]
U 136D, 0C18,0014,1180,0A88,0000,136E    ;3335             R[1]_LA+K[.4]                     ; INCREMENT ADR OF IB DATA
U 136E, 0810,0038,0180,0960,0000,136F    ;3336             D_RC[0C]                          ; GET THE LOOP COUNT
U 136F, 0019,8000,1180,0800,0010,1370    ;3337             ALU_D-K[.4],CLK.UBCC,BYTE         ; TIME FOR COMPLIMENT CARRY BIT?
U 1370, 0000,013C,F580,0800,0084,7118    ;3338             Z?,SC_K[.A]                       ; BRANCH IF YES
U 1118, 0000,003C,0180,0800,0000,1374    ;3339    =0       J/T143P1
U 1119, 0803,001C,0180,0800,0000,1371    ;3340             D_NOT.MASK                        ; RESET THE ADDRESS OF IB DATA
U 1371, 0019,0030,E580,0A88,0000,1372    ;3341             R[1]_D.OR.K[.1A]                  ; ...
U 1372, 0003,003C,0180,0A98,0000,1373    ;3342             R[3]_0                            ; SET INIT VALUE OF C BIT
U 1373, 0018,0038,0580,09F0,0000,1374    ;3343             RC[0E]_K[.1]                      ; SET EXPECTED VALUE OF C BIT
U 1374, 0810,0038,0180,0960,0000,1375    ;3344    T143P1:  D_RC[0C]                          ; GET THE LOOP COUNT
U 1375, 0019,8000,0580,09E0,0010,1376    ;3345             RC[0C]_D-K[.1],CLK.UBCC,BYTE      ; DECREMENT THE LOOP COUNT
U 1376, 0000,013C,0180,0800,0000,111A    ;3346             Z?
U 111A, 0000,003C,0180,0800,0000,135D    ;3347    =0       J/T143L1
                                         ;3348
                                         ;3349
                                         ;3350    ;//////////////////////////////////////////////////////////////////////
                                         ;3351    ;+
                                         ;3352    ; C SELECT<2:0>=HLL   C_0
                                         ;3353    ;-
                                         ;3354
U 111B, 0003,003C,0180,09F0,0000,111C    ;3355    T143S3:  RC[0E]_0                          ; INIT EXP VALUE OF C BIT
U 111C, 0000,003D,0180,0800,0000,11BF    ;3356    =0       SUBTEST
U 111D, 0000,003C,0180,0800,0000,111E    ;3357             NOP
U 111E, 0000,003D,0980,0800,0084,71C1    ;3358    =0       SETRCF[.2]
U 111F, 0000,003C,0180,0800,0000,1120    ;3359             NOP
U 1120, 2000,003D,0180,0A08,4200,11DF    ;3360    =0       ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1121, 0000,003C,0180,0800,0000,1122    ;3361             NOP
U 1122, 0000,003D,0180,0800,0000,11A5    ;3362    =0       ERLOOP
U 1123, 0818,0038,0580,0800,0000,1377    ;3363             D_K[.1]
U 1377, 0000,003C,3DF0,2C00,0000,1378    ;3364             Q_ID[PSL]
```

```
U 1378, 0019,2024,61C0,0800,0000,1379   ;3365           Q_Q.ANDNOT.K[.F]
U 1379, 081D,0030,0180,0800,0000,137A   ;3366           D_D.OR.Q
U 137A, 0000,003C,3D80,3C00,0000,137B   ;3367           ID[PSL]_D                       ; INIT THE C BIT
U 137B, 0000,C03C,0180,0800,0070,137C   ;3368   SYNC17: SET.CC(INST)                    ; EXECUTE THE TEST INSTRUCTION
U 137C, 0000,003C,3DF0,2C00,0000,137D   ;3369           Q_ID[PSL]
U 137D, 0019,2034,05C0,0800,0000,137E   ;3370           Q_Q.AND.K[.1]                   ; MASK RECEIVED C BIT
U 137E, 0810,0038,0180,0970,0000,137F   ;3371           D_RC[0E]                        ; GET EXPECTED DATA
U 137F, 001D,A000,0180,0800,0010,1380   ;3372           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 1380, 0000,013C,0180,0800,0000,1124   ;3373           Z?
U 1124, 0001,203D,0180,09E8,0000,11A8   ;3374   =0      ERROR2,RC[0D]_Q
                                        ;3375
                                        ;3376
                                        ;3377   ;//////////////////////////////////////////////////////////////////////
                                        ;3378   ;+
                                        ;3379   ; C SELECT<2:0>=LHL   C_ALU CARRY H
                                        ;3380   ;-
                                        ;3381
U 1125, 0000,003C,0180,0A08,0000,1126   ;3382   T143S4: LAB_R[1]
U 1126, 0000,003D,0180,0800,0000,11BF   ;3383   =0      SUBTEST
U 1127, 0018,0014,0980,0A88,0000,1381   ;3384           R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 1381, 0003,003C,0180,09F0,0000,1128   ;3385           RC[0E]_0                        ; INIT EXPECTED VALUE OF C BIT
U 1128, 2000,003D,0180,0A08,4200,11DF   ;3386   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1129, 0000,003C,0180,0800,0000,112A   ;3387           NOP
U 112A, 0000,003D,0180,0800,0000,11C4   ;3388   =0      CALL,J/DISPAT                   ; LOAD THE DATA TYPE LATCH
U 112B, 0000,003C,0180,0800,0000,112C   ;3389           NOP
U 112C, 0000,003D,0180,0800,0000,11A5   ;3390   =0      ERLOOP
U 112D, 0818,0038,0580,0800,0000,1382   ;3391           D_K[.1]
U 1382, 0000,003C,3DF0,2C00,0000,1383   ;3392           Q_ID[PSL]
U 1383, 0019,2024,61C0,0800,0000,1384   ;3393           Q_Q.ANDNOT.K[.F]
U 1384, 081D,0030,0180,0800,0000,1385   ;3394           D_D.OR.Q
U 1385, 0000,003C,3D80,3C00,0000,1386   ;3395           ID[PSL]_D                       ; INIT THE C BIT
U 1386, 0810,0038,0180,0970,0000,1387   ;3396           D_RC[0E]                        ; GET EXP VALUE
U 1387, 0018,0038,49C0,0800,0000,1388   ;3397           Q_K[.FF]
U 1388, 0019,E014,0580,0800,0070,1389   ;3398   SYNC18: ALU_Q+K[.1],SET.CC(INST)        ; GENERATE CARRY AND CLOCK C BIT
U 1389, 0000,003C,3DF0,2C00,0000,138A   ;3399           Q_ID[PSL]
U 138A, 0019,2034,05C0,0800,0000,138B   ;3400           Q_Q.AND.K[.1]                   ; MASK RECEIVED C BIT
U 138B, 001D,A000,0180,0800,0010,138C   ;3401           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 138C, 0000,013C,0180,0800,0000,112E   ;3402           Z?
U 112E, 0001,203D,0180,09E8,0000,11A8   ;3403   =0      ERROR2,RC[0D]_Q
U 112F, 0018,0038,0580,09F0,0000,1130   ;3404           RC[0E]_K[.1]                    ; SET EXFECTED VALUE OF C BIT
U 1130, 0000,003D,0180,0800,0000,11A5   ;3405   =0      ERLOOP
U 1131, 0F00,003C,0180,0800,0000,138D   ;3406           D_0
U 138D, 0000,003C,3DF0,2C00,0000,138E   ;3407           Q_ID[PSL]
U 138E, 0019,2024,61C0,0800,0000,138F   ;3408           Q_Q.ANDNOT.K[.F]
U 138F, 081D,0030,0180,0800,0000,1390   ;3409           D_D.OR.Q
U 1390, 0000,003C,3D80,3C00,0000,1391   ;3410           ID[PSL]_D                       ; INIT THE C BIT
U 1391, 0810,0038,01F8,0970,0000,1392   ;3411           D_RC[0E],Q_0                    ; GET EXP VALUE
U 1392, 0019,E014,0580,0800,0070,1393   ;3412   SYNC19: ALU_Q+K[.1],SET.CC(INST)        ; DON'T GEN A CARRY AND CLOCK C BIT
U 1393, 0000,003C,3DF0,2C00,0000,1394   ;3413           Q_ID[PSL]
U 1394, 0019,2034,05C0,0800,0000,1395   ;3414           Q_Q.AND.K[.1]                   ; MASK THE C BIT
U 1395, 001D,A000,0180,0800,0010,1396   ;3415           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 1396, 0000,013C,0180,0800,0000,1132   ;3416           Z?
U 1132, 0001,203D,0180,09E8,0000,11A8   ;3417   =0      ERROR2,RC[0D]_Q
U 1133, 0000,003C,0180,0800,0000,1134   ;3418           NOP
                                        ;3419
```

```

; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
;% 418
; SUBTST 1
;$ 0000
;SUBTST 2 -- LOOP COUNT = 6 & 3
;$ 5080,0050
; SUBTST 2 -- LOOP COUNT = 5 & 2
;$ 50A0,0050
; SUBTST 2 -- LOOP COUNT = 4 & 1
;$ 50C0,0050
; SUBTST 3
;$ 5028
; SUBTST 4
;$ 5082
;
; FOLLOWING IS THE AMX DATA FOR SUB TEST 2:
; EACH PASS THRU THE LOOP USES A LONG WORD
;        NO CARRY GENERATED
;% 430
;$ FF00,FFFF
;$ 00FF,FFFF
;$ FFFF,0000
;        CARRY GENERATED
;$ 00FF,0000
;$ FF00,0000
;$ 0000,FFFF

```

```
                                       ;3448    .PAGE   "TEST 144       INSTRUCTION DEPENDENT COND CODE LOAD (V BIT)"
                                       ;3449    ;*************************************************************************
                                       ;3450    ;++
                                       ;3451    ; TEST  144     INSTRUCTION DEPENDENT V BIT
                                       ;3452    ;
                                       ;3453    ; TEST DESCRIPTION
                                       ;3454    ;       THIS TEST CHECKS V SELECT VALUES OF 0, 5, AND 6 WITH SELECTED
                                       ;3455    ;       OP CODES AND DATA PATTERNS TO CHECK THE LOGIC ASSOCIATED WITH
                                       ;3456    ;       THESE VALUES OF THE V SELECT SIGNALS.
                                       ;3457    ;
                                       ;3458    ;       SUBTST 1 - CHECK V SELECT 0 AND THOSE DATA PATTERNS REQUIRING THE
                                       ;3459    ;                  ALU TO EXECUTE AN AMX+BMX TO GENERATE THE REQUIRED ALU
                                       ;3460    ;                  DATA.
                                       ;3461    ;       SUBTST 2 - CHECK V SELECT 0 AND THOSE DATA PATTERNS REQUIRING THE
                                       ;3462    ;                  ALU TO EXECUTE AN AMX.AND.BMX TO GENERATE THE REQUIRED
                                       ;3463    ;                  ALU DATA.
                                       ;3464    ;       SUBTST 3 - CHECK V SELECT 0 WITH THE "INV BMX SIGN" SIGNAL FALSE
                                       ;3465    ;                  IN DATA TYPE BYTE AND LONG. ALU FUNCTION IS AMX+BMX
                                       ;3466    ;                  TO GENERATE THE CORRECT ALU DATA.
                                       ;3467    ;       SUBTST 4 - CHECK V SELECT 0 WITH THE "INV BMX SIGN" SIGNAL FALSE
                                       ;3468    ;                  IN DATA TYPE BYTE AND LONG. ALU FUNCTION IS AMX.AND.BMX
                                       ;3469    ;                  TO GENERATE THE CORRECT ALU DATA.
                                       ;3470    ;       SUBTST 5 - CHECK V SELECT 5. THE V DETECT SW IS ALWAYS DEASSERTED
                                       ;3471    ;                  FOR THIS SELECT CODE IN VAX MODE.
                                       ;3472    ;       SUBTST 6  - CHECK V SELECT 6 WITH  V DETECT SW TRUE. CHECKS THE FUNCTION
                                       ;3473    ;                  WITH 3 VALUES OF EALU<9:8>, I.E. 01,11, AND 00.
                                       ;3474    ;       SUBTST 7 - CHECK V SELECT 6 WITH V DETECT SW FALSE. BOTH ALU=0
                                       ;3475    ;                  AND ALU.NE.0 ARE CHECKED.
                                       ;3476    ;
                                       ;3477    ; LOGIC DESCRIPTION
                                       ;3478    ;       THIS TEST CHECKS MORE OF THE INSTRUCTION DEPENDENT CONDITION CODE
                                       ;3479    ;       PROM, THE V SELECT OUTPUTS OF THE CV PROM, PART OF THE
                                       ;3480    ;       V SELECT ENCODER, AND SOME OF THE COMBINATIONAL LOGIC THAT GENERATES
                                       ;3481    ;       THE V DATA SIGNAL.. ON THE CEH MODULE.
                                       ;3482    ;
                                       ;3483    ; ERROR DESCRIPTION
                                       ;3484    ;       DATA: EXPECTED CONDITION CODES
                                       ;3485    ;             RECEIVED CONDITION CODES
                                       ;3486    ;             LOOP COUNT -- INDICATES WHICH DATA PATTERN IS BEING USED
                                       ;3487    ;               TO GENERATE THE V DATA SIGNAL.
                                       ;3488    ;               NOT USED IN SUB TEST 5.
                                       ;3489    ;
                                       ;3490    ; SYNC POINT DESCRIPTION
                                       ;3491    ;       SUBTST 1 - SYNC9F--V BIT IS LOADED
                                       ;3492    ;       SUBTST 2 - SYNC1A--V BIT IS CLOCKED
                                       ;3493    ;       SUBTST 3 - SYNC1B--V BIT IS CLOCKED
                                       ;3494    ;       SUBTST 4 - SYNC1C--V BIT IS CLOCKED
                                       ;3495    ;       SUBTST 5 - SYNC1D--V BIT IS CLOCKED
                                       ;3496    ;       SUBTST 6 - SYNC1E--V BIT IS CLOCKED
                                       ;3497    ;       SUBTST 7 - SYNC1F--V BIT IS CLOCKED
                                       ;3498    ;--
                                       ;3499    ;************************************************************************
                                       ;3500    =0
U 1134, 0018,0039,0D80,09F8,0000,1191  ;3501    T144:   NEWTST[.3]
U 1135, 0818,0038,3180,0800,0000,1136  ;3502            D_K[.40]                        ; GENERATE ADDRESS OF IB DATA
```

```
U 1136, 0000,003D,0180,0800,0000,11AA    =0      CALL[DC0]                         ; AND AMUX DATA
U 1137, 0019,0030,35C0,0A88,0000,1397            R[1]_D.OR.K[.50],Q_ALU            ; EQUALS 450(X) IB DATA
U 1397, 0019,2030,7580,0A90,0000,1398            R[2]_ALU,ALU_Q.OR.R[.20]          ; EQUALS 470(X) AMX DATA
U 1398, 0819,0030,2580,0800,0000,1399            D_D.OR.K[.A0]
U 1399, 0019,0030,6580,0A98,0000,139A            R[3]_D.OR.K[.10]                  ; SET ADR OF BMX DATA = 4B0(X)
U 139A, 0019,0030,3180,0AA0,0000,139B            R[4]_D.OR.K[.40]                  ; GEN ADR OF EXP V BIT= 4E0(X)

                                         ;//////////////////////////////////////////////////////////////////
                                         ;+
                                         ; VSEL=0---CONDITIONS REQUIRING THE ALU TO DO AN AMX PLUS BMX TO
                                         ; GENERATE THE CORRECT ALU DATA
                                         ;-

U 139B, 0818,0038,1180,0800,0000,139C    T144S1: D_K[.4]
U 139C, 0019,0014,0580,09E0,0000,1138            RC[0C]_D+K[.1]                    ; SET THE LOOP COUNT
U 1138, 0000,003D,0180,0800,0000,11BF    =0      SUBTEST
U 1139, 0000,003C,0180,0800,0000,113A            NOP
                                         =0
U 113A, 0000,003D,0180,0800,0000,11C6    T144L1: CALL,J/GETDATA                    ; FE~CH THE AMX, BMX, AND EXP DATA
U 113B, 0000,003C,0180,0800,0000,113C            NOP
U 113C, 0000,003D,0180,0800,0000,11A5    =0      ERLOOP
U 113D, 0000,003C,0180,0800,0000,113E            NOP
U 113E, 0000,003D,0180,0800,0000,11CF    =0      CALL,J/INITVBIT                   ; SET V BIT TO COMPLIMENT OF EXPECTED
U 113F, 0010,C014,0180,0800,0070,139D    SYNC9F: ALU_LA+LC,SET.CC(INST)            ; EXECUTE THE TEST
U 139D, 0000,003C,3DF0,2C00,0000,139E            Q_IB[PSL]                         ; GET THE V BIT
U 139E, 0019,2034,09C0,0800,0000,139F            Q_Q.AND.K[.2]                     ; MASK
U 139F, 001D,A000,0180,0800,0010,13A0            ALU_Q-D,CLK.UBCC,BYTE             ; CHECK
U 13A0, 0000,013C,0180,0800,0000,1140            Z?
U 1140, 0001,203D,0180,09E8,0000,11A8    =0      ERROR2,RC[0D]_Q

                                         ;+
                                         ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                         ;-

U 1141, 0000,003C,0180,0A10,0000,13A1            LAB_R[2]
U 13A1, 0018,0014,1180,0A90,0000,13A2            R[2]_LA+K[.4]                     ; INCREMENT ADR OF AMX DATA
U 13A2, 0000,003C,0180,0A18,0000,13A3            LAB_R[3]
U 13A3, 0018,0014,1180,0A98,0000,13A4            R[3]_LA+K[.4]                     ; AND BMX DATA
U 13A4, 0000,003C,0180,0A20,0000,13A5            LAB_R[4]
U 13A5, 0018,0014,0580,0AA0,0000,13A6            R[4]_LA+K[.1]                     ; AND EXFECTED DATA
U 13A6, 0810,0038,0180,0960,0000,13A7            D_RC[0C]
U 13A7, 0019,8000,0580,09E0,0010,13A8            RC[0C]_D-K[.1],CLK.UBCC,BYTE      ; CHECK LOOP COUNT
U 13A8, 0000,013C,0180,0800,0000,1142            Z?
U 1142, 0000,003C,0180,0800,0000,113A    =0      J/T144L1


                                         ;//////////////////////////////////////////////////////////////////
                                         ;+
                                         ; VSELECT-0---AMX AND BMX PATTERNS THAT REQUIRE THE ALU TO DO AN AMX .AND.
                                         ; BMX TO GET THE CORRECT ALU DATA
                                         ;-

U 1143, 0018,0038,0D80,09E0,0000,1144    T144S2: RC[0C]_K[.3]                      ; SET THE LOOP COUNT
U 1144, 0000,003D,0180,0800,0000,11BF    =0      SUBTEST
U 1145, 0000,003C,0180,0800,0000,1146            NOP
```

```
                                           ;3558    =0
U 1146, 0000,003D,0180,0800,0000,11C6      ;3559    T144L2: CALL,J/GETDATA                      ; GET AMX, BMX, AND EXP DATA
U 1147, 0000,003C,0180,0800,0000,1148      ;3560            NOP
U 1148, 0000,003D,0180,0800,0000,11A5      ;3561    =0      ERLOOP
U 1149, 0000,003C,0180,0800,0000,114A      ;3562            NOP
U 114A, 0000,003D,0180,0800,0000,11CF      ;3563    =0      CALL,J/INITVBIT                     ; SET COMPLIMENT V BIT
U 114B, 0010,C034,0180,0800,0070,13A9      ;3564    SYNC1A: ALU_LA.AND.LC,SET.CC(INST)          ; EXECUTE THE TEST
U 13A9, 0000,003C,3DF0,2C00,0000,13AA      ;3565            Q_ID[PSL]
U 13AA, 0019,2034,09C0,0800,0000,13AB      ;3566            Q_Q.AND.K[.2]                       ; MASK RECEIVED V BIT
U 13AB, 001D,A000,0180,0800,0010,13AC      ;3567            ALU_Q-D,CLK.UBCC,BYTE               ; CHECK
U 13AC, 0000,013C,0180,0800,0000,114C      ;3568            Z?
U 114C, 0001,203D,0180,09E8,0000,11A8      ;3569    =0      ERROR2,RC[0D]_Q
U 114D, 0000,003C,0180,0A10,0000,13AD      ;3570            LAB_R[2]
U 13AD, 0018,0014,1180,0A90,0000,13AE      ;3571            R[2]_LA+K[.4]                       ; INCREMENT ADR OF AMX DATA
U 13AE, 0000,003C,0180,0A18,0000,13AF      ;3572            LAB_R[3]
U 13AF, 0018,0014,1180,0A98,0000,13B0      ;3573            R[3]_LA+K[.4]                       ; AND BMX DATA
U 13B0, 0000,003C,0180,0A20,0000,13B1      ;3574            LAB_R[4]
U 13B1, 0018,0014,0580,0AA0,0000,13B2      ;3575            R[4]_LA+K[.1]                       ; AND EXPECTED DATA
U 13B2, 0810,0038,0180,0960,0000,13B3      ;3576            D_RC[0C]
U 13B3, 0019,8000,0580,09E0,0010,13B4      ;3577            RC[0C]_D-K[.1],CLK.UBCC,BYTE        ; CHECK LOOP COUNT
U 13B4, 0000,013C,0180,0800,0000,114E      ;3578            Z?
U 114E, 0000,003C,0180,0800,0000,1146      ;3579    =0      J/T144L2
                                           ;3580
                                           ;3581
                                           ;3582    ;///////////////////////////////////////////////////////////////////////
                                           ;3583    ;+
                                           ;3584    ; VSELECT=0 * INV BMX SIGN IS FALSE. FIRST TIME THRU LOOP IS DATA TYPE
                                           ;3585    ; BYTE, SECOND TIME IS DATA TYPE LONG. ALU FUNCTION IS AMX PLUS BMX
                                           ;3586    ;-
                                           ;3587
U 114F, 0000,003C,0180,0A08,0000,13B5      ;3588    T144S3: LAB_R[1]
U 13B5, 0018,0014,1180,0A88,0000,1150      ;3589            R[1]_LA+K[.4]                       ; INCRMENT ADR OF IB DATA
U 1150, 0000,003D,0180,0800,0000,11BF      ;3590    =0      SUBTEST
U 1151, 0018,0038,0980,09E0,0000,1152      ;3591            RC[0C]_K[.2]                        ; SET THE LOOP COUNT
                                           ;3592    =0
U 1152, 0000,003D,0180,0800,0000,11C6      ;3593    T144L3: CALL,J/GETDATA                      ; FETCH AMX, BMX, AND EXP DATA
U 1153, 0000,003C,0180,0800,0000,1156      ;3594            NOP
U 1156, 0000,003D,0180,0800,0000,11A5      ;3595    =0      ERLOOP
U 1157, 0000,003C,0180,0800,0000,1158      ;3596            NOP
U 1158, 0000,003D,0180,0800,0000,11CF      ;3597    =0      CALL,J/INITVBIT                     ; SET COMPLIMENT V BIT
U 1159, 0010,C014,0180,0800,0070,13B6      ;3598    SYNC1B: ALU_LA+LC,SET.CC(INST)              ; EXECUTE THE TEST
U 13B6, 0000,003C,3DF0,2C00,0000,13B7      ;3599            Q_ID[PSL]
U 13B7, 0019,2034,09C0,0800,0000,13B8      ;3600            Q_Q.AND.K[.2]                       ; MASK V BIT
U 13B8, 001D,A000,0180,0800,0010,13B9      ;3601            ALU_Q-D,CLK.UBCC,BYTE               ; CHECK
U 13B9, 0000,013C,0180,0800,0000,115A      ;3602            Z?
U 115A, 0001,203D,0180,09E8,0000,11A8      ;3603    =0      ERROR2,RC[0D]_Q
                                           ;3604
                                           ;3605    ;+
                                           ;3606    ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                           ;3607    ;-
                                           ;3608
U 115B, 0000,003C,0180,0A10,0000,13BA      ;3609            LAB_R[2]
U 13BA, 0018,0014,1180,0A90,0000,13BB      ;3610            R[2]_LA+K[.4]                       ; INCREMENT ADR OF AMX DATA
U 13BB, 0000,003C,0180,0A18,0000,13BC      ;3611            LAB_R[3]
U 13BC, 0018,0014,1180,0A98,0000,13BD      ;3612            R[3]_LA+K[.4]                       ; AND BMX DATA
```

```
U 13BD, 0000,003C,0180,0A20,0000,13BE   ;3613           LAB_R[4]
U 13BE, 0018,0014,0580,0AA0,0000,13BF   ;3614           R[4]_LA+K[.1]                   ; AND EXPECTED DATA
U 13BF, 0000,003C,0180,0A08,0000,13C0   ;3615           LAB_R[1]
U 13C0, 0018,0014,1180,0A88,0000,13C1   ;3616           R[1]_LA+K[.4]                   ; INCREMENT ADR OF IB DATA
U 13C1, 0810,0038,0180,0960,0000,13C2   ;3617           D_RC[OC]
U 13C2, 0019,8000,0580,09E0,0010,13C3   ;3618           RC[OC]_D-K[.1],CLK.UBCC,BYTE    ; CHECK LOOP COUNT
U 13C3, 0000,013C,0180,0800,0000,115C   ;3619           Z?
U 115C, 0000,003C,0180,0800,0000,1152   ;3620   =0      J/T144L3
                                        ;3621
                                        ;3622
                                        ;3623   ;//////////////////////////////////////////////////////////////////////
                                        ;3624   ;+
                                        ;3625   ; VSELECT=0 * INV BMX SIGN IS FALSE. ALU MUST BE DOING AN AMX .AND.
                                        ;3626   ; BMX FUNCTION TO GET CORRECT ALU DATA. FIRST TIME THRU LOOP IS DATA TYPE
                                        ;3627   ; BYTE, SECOND TIME IS DATA TYPE LONG.
                                        ;3628   ;-
                                        ;3629
U 115D, 0018,0038,0980,09E0,0000,115E   ;3630   T144S4: RC[OC]_K[.2]                    ; SET THE LOOP COUNT
U 115E, 0000,003D,0180,0800,0000,11BF   ;3631   =0      SUBTEST
U 115F, 0000,003C,0180,0A08,0000,13C4   ;3632           LAB_R[1]
U 13C4, 0018,0000,0180,0A88,0000,1160   ;3633           R[1]_LA-K[.8]                   ; SET ADR OF IB DATA
                                        ;3634   =0
U 1160, 0000,003D,0180,0800,0000,11C6   ;3635   T144L4: CALL,J/GETDATA                  ; GET AMX, BMX, AND EXP DATA
U 1161, 0000,003C,0180,0800,0000,1162   ;3636           NOP
U 1162, 0000,003D,0180,0800,0000,11A5   ;3637   =0      ERLOOP
U 1163, 0000,003C,0180,0800,0000,1164   ;3638           NOP
U 1164, 0000,003D,0180,0800,0000,11CF   ;3639   =0      CALL,J/INITVBIT                 ; SET COMPLIMENT V BIT
U 1165, 0010,C034,0180,0800,0070,13C5   ;3640   SYNC1C: ALU_LA.AND.LC,SET.CC(INST)      ; EXECUTE THE TEST
U 13C5, 0000,003C,3DF0,2C00,0000,13C6   ;3641           Q_ID[PSL]
U 13C6, 0019,2034,09C0,0800,0000,13C7   ;3642           Q_Q.AND.K[.2]                   ; MASK V BIT
U 13C7, 001D,A000,0180,0800,0010,13C8   ;3643           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 13C8, 0000,013C,0180,0800,0000,1166   ;3644           Z?
U 1166, 0001,203D,0180,09E8,0000,11A8   ;3645   =0      ERROR2,RC[OD]_Q
                                        ;3646
                                        ;3647   ;+
                                        ;3648   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3649   ;-
                                        ;3650
U 1167, 0000,003C,0180,0A10,0000,13C9   ;3651           LAB_R[2]
U 13C9, 0018,0014,1180,0A90,0000,13CA   ;3652           R[2]_LA+K[.4]                   ; INCREMENT ADR OF AMX DATA
U 13CA, 0000,003C,0180,0A18,0000,13CB   ;3653           LAB_R[3]
U 13CB, 0018,0014,1180,0A98,0000,13CC   ;3654           R[3]_LA+K[.4]                   ; AND BMX DATA
U 13CC, 0000,003C,0180,0A20,0000,13CD   ;3655           LAB_R[4]
U 13CD, 0018,0014,0580,0AA0,0000,13CE   ;3656           R[4]_LA+K[.1]                   ; AND EXPECTED DATA
U 13CE, 0000,003C,0180,0A08,0000,13CF   ;3657           LAB_R[1]
U 13CF, 0018,0014,1180,0A88,0000,13D0   ;3658           R[1]_LA+K[.4]                   ; INCREMENT ADR OF IB DATA
U 13D0, 0810,0038,0180,0960,0000,13D1   ;3659           D_RC[OC]
U 13D1, 0019,8000,0580,09E0,0010,13D2   ;3660           RC[OC]_D-K[.1],CLK.UBCC,BYTE    ; CHECK LOOP COUNT
U 13D2, 0000,013C,0180,0800,0000,1168   ;3661           Z?
U 1168, 0000,003C,0180,0800,0000,1160   ;3662   =0      J/T144L4
U 1169, 0000,003C,0180,0800,0000,116A   ;3663           NOP
                                        ;3664
                                        ;3665
                                        ;3666   ;//////////////////////////////////////////////////////////////////////
                                        ;3667   ;+
                                          ;3668   ; VSELECT=5--- PSL V_VDETECT SW
                                          ;3669   ;-
                                          ;3670
                                          ;3671   =0
U 116A, 0000,003D,0180,0800,0000,11C6     ;3672   T144S5: CALL,J/GETDATA                ; GET EXP DATA
U 116B, 0000,003C,0180,0800,0000,116C     ;3673           NOP
U 116C, 0000,003D,0180,0800,0000,11BF     ;3674   =0      SUBTEST
U 116D, 0000,003C,0180,0800,0000,116E     ;3675           NOP
U 116E, 0000,003D,0180,0800,0000,11A5     ;3676   =0      ERLOOP
U 116F, 0000,003C,0180,0800,0000,1170     ;3677           NOP
U 1170, 0000,003D,0180,0800,0000,11CF     ;3678   =0      CALL,J/INITVBIT               ; SET COMPLIMENT V BIT
U 1171, 0000,C03C,0180,0800,0070,13D3     ;3679   SYNC1D: SET.CC(INST)                  ; EXECUTE THE TEST
U 13D3, 0000,003C,3DF0,2C00,0000,13D4     ;3680           Q_ID[PSL]
U 13D4, 0019,2034,09C0,0800,0000,13D5     ;3681           Q_Q.AND.K[.2]                 ; MASK THE V BIT
U 13D5, 001D,A000,0180,0800,0010,13D6     ;3682           ALU_Q-D,CLK.UBCC,BYTE         ; CHECK
U 13D6, 0000,013C,0180,0800,0000,1172     ;3683           Z?
U 1172, 0001,203D,0180,09E8,0000,11A8     ;3684   =0      ERROR2,RC[OD]_Q
                                          ;3685
                                          ;3686
                                          ;3687   ;/////////////////////////////;/////////////////////////////////////////
                                          ;3688   ;+
                                          ;3689   ; VSELECT=6 * VDETECT SW IS TRUE--- PSL V_VDETECT SW*EALU<9:8>=01
                                          ;3690   ;-
                                          ;3691
U 1173, 0018,0038,0D80,09E0,0000,1174     ;3692   T144S6: RC[OC]_K[.3]                  ; SET THE LOOP COUNT
U 1174, 0000,003D,0180,0800,0000,11BF     ;3693   =0      SUBTEST
U 1175, 0000,003C,0180,0A20,0000,13D7     ;3694           LAB_R[4]
U 13D7, 0018,0014,0580,0AA0,0000,13D8     ;3695           R[4]_LA+K[.1]                 ; INCREMENT ADR OF EXP DATA
U 13D8, 0000,003C,0180,0A08,0000,13D9     ;3696           LAB_R[1]
U 13D9, 0018,0014,1180,0A88,0000,1176     ;3697           R[1]_LA+K[.4]                 ; INCREMENT ADR OF IB DATA
                                          ;3698   =0
U 1176, 0000,003D,0180,0800,0000,11C6     ;3699   T144L6: CALL,J/GETDATA                ; GET EALU DATA AND EXP V BIT
U 1177, 0000,003C,0180,0A00,0082,1178     ;3700           SC_R[0]                       ; PUT EALU DATA IN SC
U 1178, 0000,003D,0180,0800,0000,11A5     ;3701   =0      ERLOOP
U 1179, 0000,003C,0180,0800,0000,117A     ;3702           NOP
U 117A, 0000,003D,0180,0800,0000,11CF     ;3703   =0      CALL,J/INITVBIT               ; SET COMPLIMENT V BIT
U 117B, 0000,C03C,0180,0800,0070,13DA     ;3704   SYNC1E: EALU_SC,SET.CC(INST)          ; EXECUTE THE TEST
U 13DA, 0000,003C,3DF0,2C00,0000,13DB     ;3705           Q_ID[PSL]
U 13DB, 0019,2034,09C0,0800,0000,13DC     ;3706           Q_Q.AND.K[.2]                 ; MASK THE V BIT
U 13DC, 001D,A000,0180,0800,0010,13DD     ;3707           ALU_Q-D,CLK.UBCC,BYTE         ; CHECK
U 13DD, 0000,013C,0180,0800,0000,117C     ;3708           Z?
U 117C, 0001,203D,0180,09E8,0000,11A8     ;3709   =0      ERROR2,RC[OD]_Q
                                          ;3710
                                          ;3711   ;+
                                          ;3712   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                          ;3713   ;-
                                          ;3714
U 117D, 0000,003C,0180,0A10,0000,13DE     ;3715           LAB_R[2]
U 13DE, 0018,0014,1180,0A90,0000,13DF     ;3716           R[2]_LA+K[.4]                 ; INCREMENT ADR OF AMX DATA
U 13DF, 0000,003C,0180,0A20,0000,13E0     ;3717           LAB_R[4]
U 13E0, 0018,0014,0580,0AA0,0000,13E1     ;3718           R[4]_LA+K[.1]                 ; INCREMENT ADR OF EXP V BIT
U 13E1, 0810,0038,0180,0960,0000,13E2     ;3719           D_RC[OC]
U 13E2, 0019,8000,0580,09E0,0010,13E3     ;3720           RC[OC]_D-K[.1],CLK.UBCC,BYTE  ; CHECK LOOP COUNT
U 13E3, 0000,013C,0180,0800,0000,117E     ;3721           Z?
U 117E, 0000,003C,0180,0800,0000,1176     ;3722   =0      J/T144L6
```

```


                                            ;//////////////////////////////////////////////////////////////////
                                            ;+
                                            ; VSELECT=6 * VDETECT SW IS FALSE.--- PSL V_-VDETECT SW*-ALU=0
                                            ;-

U 117F, 0000,003C,0180,0A08,0000,1180       T144S7: LAB_R[1]
U 1180, 0000,003D,0180,0800,0000,11BF       =0      SUBTEST
U 1181, 0018,0014,1180,0A88,0000,13E4               R[1]_LA+K[.4]                   ; INCREMENT ADR OF IB DATA
U 13E4, 0018,0038,4980,0A80,0000,13E5               R[0]_K[.FF]                     ; SET ALU DATA
U 13E5, 0018,0038,0980,09F0,0000,13E6               RC[0E]_K[.2]                    ; SET EXP DATA
U 13E6, 0018,0038,0980,09E0,0000,1182               RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 1182, 0000,003D,0180,0800,0000,11A5       =0      ERLOOP
U 1183, 0000,003C,0180,0800,0000,1184               NOP
                                            =0
U 1184, 2000,003D,0180,0A08,4200,11DF       T144L7: ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1185, 0000,003C,0180,0800,0000,1186               NOP
U 1186, 0000,003D,0180,0800,0000,11C4       =0      CALL,J/DISPAT                   ; LATCH THE DATA TYPE
U 1187, 0000,003C,0180,0800,0000,1188               NOP
U 1188, 0000,003D,0180,0800,0000,11CF       =0      CALL,J/INITVBIT                 ; SET COMPLIMENT V BIT
U 1189, 0000,C03C,0180,0A00,0070,13E7       SYNC1F: ALU_R[0],SET.CC(INST)           ; EXECUTE THE TEST
U 13E7, 0000,003C,3DF0,2C00,0000,13E8               Q_IB[PSL]
U 13E8, 0019,2034,09C0,0800,0000,13E9               Q_Q.AND.K[.2]                   ; MASK THE V BIT
U 13E9, 001D,A000,0180,0800,0010,13EA               ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 13EA, 0000,013C,0180,0800,0000,118A               Z?
U 118A, 0001,203D,0180,09E8,0000,11A8       =0      ERROR2,RC[0D]_Q

                                            ;+
                                            ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                            ;-

U 118B, 0003,003C,0180,0A80,0000,13EB               R[0]_0                          ; SET ALU DATA
U 13EB, 0003,003C,0180,09F0,0000,13EC               RC[0E]_0                        ; SET EXPECTED DATA
U 13EC, 0810,0038,0180,0960,0000,13ED               D_RC[0C]
U 13ED, 0019,8000,0580,09E0,0010,13EE               RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK LOOP COUNT
U 13EE, 0000,013C,0180,0800,0000,118C               Z?
U 118C, 0000,003C,0180,0800,0000,1184       =0      J/T144L7
U 118D, 0000,003C,0180,0800,0000,118E               NOP


                                            ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST
                                            ;% 450
                                            ; VSELECT=0, INV BMX SIGN TRUE, DATA TYPE BYTE, SUBTST 1 & 2
                                            ;$ 5080,0050
                                            ; VSELECT=0, INV BMX SIGN FALSE, DATA TYPE BYTE, SUBTST 3 & 4, LOOP COUNT = 2
                                            ;$ 6096,0000
                                            ; VSELECT=0, INV BMX SIGN FALSE, DATA TYPE LONG, SUBTST 3 & 4, LOOP COUNT = 1
                                            ;$ 50F2,0000
                                            ; VSELECT=5, SUBTST 5
                                            ;$ 0000,0000
                                            ; VSELECT=6, VDETECT SW TRUE, DATA TYPE FLOAT, SUBTST 6
                                            ;$ 6040,0050
                                            ; VSELECT=6, VDETECT SW FALSE, DATA TYPE FLOAT, SUBTST 7
                                            ;$ 6048,0000
```

```

                                                 ;
                                                 ; THE FOLLOWING IS THE AMX DATA FOR THE ABOVE TEST:
                                                 ;% 470
                                                 ; SUBTST 1, LOOP COUNT 4 THRU 1
                                                 ;$ 8080,8000
                                                 ;$ 8040,8000
                                                 ;$ 0000,0000
                                                 ;$ 8080,8000
                                                 ;$ 0000,0000
                                                 ; SUBTST 2, LOOP COUNT 3 THRU 1
                                                 ;$ 8080,8000
                                                 ;$ 0000,0000
                                                 ;$ 0080,0000
                                                 ; SUBTST 3, LOOP COUNT 2 AND 1
                                                 ;$ 0000,0000
                                                 ;$ 0000,0000
                                                 ; SUBTST 4, LOOP COUNT 2 AND 1
                                                 ;$ 8080,8000
                                                 ;$ 8080,8000
                                                 ; EALU DATA, SUBTST 6
                                                 ;$ 0100,0000
                                                 ;$ 300,0000
                                                 ;$ 0000,0000
                                                 ;
                                                 ; THE FOLLOWING IS THE BMX DATA FOR THE ABOVE TEST:
                                                 ;% 480
                                                 ; SUBTST 1, LOOP COUNT 5 THRU 1
                                                 ;$ 0080,0000
                                                 ;$ 8040,8000
                                                 ;$ 0080,0000
                                                 ;$ 8000,8000
                                                 ;$ 8000,8000
                                                 ; SUBTST 2, LOOP COUNT 3 THRU 1
                                                 ;$ 8000,8000
                                                 ;$ 0080,0000
                                                 ;$ 0080,0000
                                                 ; SUBTST 3, LOOP COUNT 2 AND 1
                                                 ;$ 0080,0000
                                                 ;$ 0000,8000
                                                 ; SUBTST 4, LOOP COUNT 2 AND 1
                                                 ;$ 8000,8000
                                                 ;$ 8080,0000
                                                 ;
                                                 ; THE FOLLOWING IS THE EXPECTED V BIT FOR THE ABOVE TEST:
                                                 ;% 4E0
                                                 ;$ 0202,0000,0000,0000,0202,0000,0200,0000


                                                 =0
U 118E, 0000,003D,0180,0800,0000,1191            T145:   NEWTST
U 118F, 0000,003C,0180,0800,0000,13EF                    NOP
U 13EF, 0000,003D,0180,0800,0000,1191            ENDTST: NEWTST

```

```
;                              Location / Line Number Index

;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 0000 - 0FFF Unused
U 1000           1876:   1845    1847=   1866=   1867=   1868=   1884=   1885=
U 1008           2072=   2073=   2158=   2159=   2179=   2180=   2253=   2254=
U 1010           2039=   2040=   2041=   2042=   2043=   2044=   2045=   2046=
U 1018           2181=   2182=   2183=   2184=   2188=   2189=   2278=   2279=
U 1020           2195=   2196=   2234=   2235=   2236=   2237=   1846    2676=
U 1028           2245=   2246=   2247=   2248=   2249=   2250=   1869    2677=
U 1030           2259=   2267=   2269=   2270=   2272=   2273=   1870    2720=
U 1038           2274=   2275=   2283=   2284=   2373=   2374=   1871    2721=
U 1040           2375=   2376=   2378=   2379=   2388=   2389=   2401=   2402=
U 1048           2404=   2405=   2409=   2415=   2426=   2434=   1920:   1872
U 1050           2438=   2439=   2440=   2441=   2451=   2452=   2454=   2455=
U 1058           2459=   2465=   1924:   1873    2476=   2477=   1928:   1874
U 1060           2485=   2493=   2495=   2496=   2497=   2498=   2499=   2500=
U 1068           2517=   2518=   2519=   2520=   2521=   2522=   2528=   2534=
U 1070           2545=   2546=   2640=   2641=   2650=   2651=   2652=   2653=
U 1078           2660=   2666=   2670=   2671=   2683=   2691=   2692=   2693=
U 1080           2695=   2696=   2703=   2709=   2713=   2714=   2729=   2737=
U 1088           2738=   2739=   2740=   2741=   2748=   2749=   2753=   2761=
U 1090           2762=   2763=   2764=   2765=   2766=   2767=   2774=   2775=
U 1098           2776=   2777=   2785=   2793=   2794=   2795=   2796=   2797=
U 10A0           2804=   2805=   2806=   2807=   2815=   2816=   2860=   2868=
U 10A8           2869=   2870=   2871=   2872=   2879=   2880=   2888=   2889=
U 10B0           2894=   2895=   2903=   2904=   2909=   2910=   2918=   2919=
U 10B8           2926=   2934=   2935=   2936=   2937=   2938=   2939=   2940=
U 10C0           2948=   2949=   2954=   2955=   2959=   2960=   3024=   3025=
U 10C8           3033=   3034=   3035=   3036=   3044=   3050=   3051=   3052=
U 10D0           3060=   3071=   3072=   3073=   3081=   3087=   3088=   3089=
U 10D8           3097=   3105=   3106=   3107=   3108=   3109=   3111=   3112=
U 10E0           3117=   3118=   3126=   3133=   3135=   3136=   3144=   3150=
U 10E8           3155=   3156=   3164=   3170=   3174=   3175=   3183=   3184=
U 10F0           3196=   3197=   3243=   3250=   3251=   3252=   3256=   3257=
U 10F8           3258=   3259=   3269=   3270=   3281=   3289=   3291=   3292=
U 1100           1831:   1832:   1833:   1834:   1835:   1836:   1837:   1838:
U 1108           1839:   1875    3293=   3294=   1840:   1841:   1842:   1843:
U 1110           3309=   3310=   3311=   3312=   3313=   3314=   3326=   3332=
U 1118           3339=   3340=   3347=   3355=   3356=   3357=   3358=   3359=
U 1120           3360=   3361=   3362=   3363=   3374=   3382=   3383=   3384=
U 1128           3386=   3387=   3388=   3389=   3390=   3391=   3403=   3404=
U 1130           3405=   3406=   3417=   3418=   3501=   3502=   3503=   3504=
U 1138           3518=   3519=   3521=   3522=   3523=   3524=   3525=   3526=
U 1140           3531=   3537=   3546=   3555=   3556=   3557=   3559=   3560=
U 1148           3561=   3562=   3563=   3564=   3569=   3570=   3579=   3588=
U 1150           3590=   3591=   3593=   3594=   1882    2012:   3595=   3596=
U 1158           3597=   3598=   3603=   3609=   3620=   3630=   3631=   3632=
U 1160           3635=   3636=   3637=   3638=   3639=   3640=   3645=   3651=
U 1168           3662=   3663=   3672=   3673=   3674=   3675=   3676=   3677=
U 1170           3678=   3679=   3684=   3692=   3693=   3694=   3699=   3700=
U 1178           3701=   3702=   3703=   3704=   3709=   3715=   3722=   3730=
U 1180           3731=   3732=   3736=   3737=   3739=   3740=   3741=   3742=
U 1188           3743=   3744=   3749=   3755=   3760=   3761=   3828=   3829=
U 1190           1883    1897    1898    1899    1900    1901    1902    1903
U 1198           1904    1905    1906    1907    1908    1909    1910    1911
```

```
;Location           0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0              1912    1913    1914    1915    1916    1917    1918    1919
U 11A8              1922    1923    1966    1967    1968    1969    1970    1971
U 11B0              1972    1973    1974    1975    1976    1977    1978    1979
U 11B8              1980    1981    1983    1984    1985    1986    1988    1998
U 11C0              1999    2007    2008    2009    2018    2047    2063    2064
U 11C8              2065    2066    2067    2068    2069    2070    2071    2082
U 11D0              2083    2084    2085    2086    2087    2088    2089    2098
U 11D8              2099    2100    2101    2102    2103    2104    2105    2116
U 11E0              2117    2118    2119    2120    2121    2122    2126    2127
U 11E8              2128    2129    2130    2160    2161    2162    2163    2164
U 11F0              2165    2166    2167    2168    2169    2176    2177    2178
U 11F8              2185    2186    2187    2190    2191    2192    2193    2194
U 1200              2021:   2244    2022:   2251    2023:   2252    2024:   2255
U 1208              2025:   2256    2257    2258    2268    2271    2276    2277
U 1210              2280    2281    2282    2377    2386    2387    2390    2391
U 1218              2392    2393    2394    2395    2396    2397    2398    2399
U 1220              2400    2403    2406    2407    2408    2416    2417    2418
U 1228              2419    2420    2421    2422    2423    2424    2425    2435
U 1230              2436    2437    2442    2443    2444    2445    2446    2447
U 1238              2448    2449    2450    2453    2456    2457    2458    2466
U 1240              2467    2468    2469    2470    2471    2472    2473    2474
U 1248              2475    2478    2479    2480    2481    2482    2483    2484
U 1250              2494    2501    2502    2503    2504    2505    2507    2508
U 1258              2509    2510    2511    2512    2513    2514    2515    2516
U 1260              2523    2524    2525    2526    2527    2535    2536    2537
U 1268              2538    2539    2540    2541    2542    2543    2544    2642
U 1270              2649    2654    2655    2656    2657    2658    2659    2667
U 1278              2668    2669    2672    2673    2674    2675    2678    2679
U 1280              2680    2681    2682    2697    2698    2699    2700    2701
U 1288              2702    2710    2711    2712    2715    2716    2717    2026:
U 1290              2718    2719    2722    2723    2724    2725    2726    2727
U 1298              2728    2742    2743    2744    2745    2746    2747    2750
U 12A0              2751    2752    2768    2769    2770    2771    2772    2773
U 12A8              2778    2780    2028:   2781    2782    2783    2784    2798
U 12B0              2799    2800    2801    2802    2803    2808    2810    2811
U 12B8              2812    2813    2814    2873    2874    2875    2876    2877
U 12C0              2878    2881    2882    2883    2027:   2884    2885    2886
U 12C8              2887    2890    2891    2892    2893    2896    2897    2898
U 12D0              2899    2900    2901    2902    2905    2906    2907    2908
U 12D8              2911    2912    2913    2914    2915    2916    2917    2920
U 12E0              2921    2922    2923    2924    2925    2941    2942    2943
U 12E8              2944    2945    2946    2947    2950    2951    2952    2953
U 12F0              2956    2957    2958    3037    3038    3039    3040    3041
U 12F8              3042    3043    3053    3054    3055    3056    3057    3058
U 1300              3059    3074    3075    3076    3077    3078    3079    3080
U 1308              3090    3091    3092    3093    3094    3095    3096    3110
U 1310              3113    3114    3115    3116    3119    3120    3121    3122
U 1318              3123    3124    3125    3134    3137    3138    3139    3140
U 1320              3141    3142    3143    3151    3152    3153    3154    3157
U 1328              3158    3159    3160    3161    3162    3163    3171    3172
U 1330              3173    3176    3177    3178    3179    3180    3181    3182
U 1338              3190    3191    3192    3193    3194    3195    3253    3254
U 1340              3260    3261    3262    3263    3264    3265    3266    3267
```

```
;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 1348           3268     3271     3272     3273     3274     3275     3276     3277
U 1350           3278     3279     3280     3295     3296     3297     3298     3299
U 1358           3300     3301     3302     3303     3304     3306     3307     3308
U 1360           3315     3316     3317     3318     3319     3320     3321     3322
U 1368           3323     3324     3325     3333     3334     3335     3336     3337
U 1370           3338     3341     3342     3343     3344     3345     3346     3364
U 1378           3365     3366     3367     3368     3369     3370     3371     3372
U 1380           3373     3385     3392     3393     3394     3395     3396     3397
U 1388           3398     3399     3400     3401     3402     3407     3408     3409
U 1390           3410     3411     3412     3413     3414     3415     3416     3505
U 1398           3506     3507     3508     3516     3517     3527     3528     3529
U 13A0           3530     3538     3539     3540     3541     3542     3543     3544
U 13A8           3545     3565     3566     3567     3568     3571     3572     3573
U 13B0           3574     3575     3576     3577     3578     3589     3599     3600
U 13B8           3601     3602     3610     3611     3612     3613     3614     3615
U 13C0           3616     3617     3618     3619     3633     3641     3642     3643
U 13C8           3644     3652     3653     3654     3655     3656     3657     3658
U 13D0           3659     3660     3661     3680     3681     3682     3683     3695
U 13D8           3696     3697     3705     3706     3707     3708     3716     3717
U 13E0           3718     3719     3720     3721     3733     3734     3735     3745
U 13E8           3746     3747     3748     3756     3757     3758     3759     3830
U 13F0           1934:    1935:    1936:    1937:    1938:    1939:    1940:    1941:
U 13F8           1942:    1943:    1944:    1945:    1946:    1947:    1948:    1949:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH38       1024

Used            1024
Remaining

Total microwords used in memory U: 1024
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH38.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3      Control ROM Field Definitions
; 548    Register Transfer Macro Definitions
; 1413   Non-transfer Functions
; 1485   Branch Enable Macro Definitions
; 1564   MICRO DIAGNOSTIC DEFINED MACROS
; 2113   TEST 146          INSTRUCTION DEPENDENT COND CODE LOAD (Z BIT)
; 2313   TEST 147          INSTRUCTION DEPENDENT COND CODE LOAD (N BIT)
; 2545   TEST 148          CM CONDITION CODE LOAD = 4
; 2620   TEST 149          CM CONDITION CODE LOAD = 5 (Z BIT)
; 2690   TEST 14A          CM CONDITION CODE LOAD = 6 (C, Z, AND N BITS)
; 2762   TEST 14B          CM CONDITION CODE LOAD = 6 (V BIT)
; 2882   TEST 14C          CM INSTRUCTION DEPENDENT COND CODE LOAD
; 3362   TEST 14D          CM BRANCH ENABLE 8 -- END DP1
; 3463   TEST 14E          CM BRANCH ENABLE 9 -- PC MODES
; 3546   TEST 14F          CM BRANCH ENABLE A -- REI
; 3627   TEST 150          VAX MODE BRANCH ENABLE 8 -- DATA TYPE
```

```
;1      .NOLIST
;1804   .LIST
;1805
```

```
                                                .REGION/1000,13FF

                                                ;+
                                                ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                                ; WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
                                                ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                                ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                                ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                                ;
                                                ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                                ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                                ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                                ;       R[OF] AND DO A RETURNO.
                                                ;
                                                ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                                ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                                ; TO THE CONSOLE.
                                                ;
                                                ; THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
                                                ; ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURNO IF THE TRAP WAS
                                                ; EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
                                                ; RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
                                                ; STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.
                                                ;-

U 1100, 0000,003C,19C0,0A78,0084,7001           1100:   SC_K[ZERO],Q_R[OF],J/TRPHO      ; SYSTEM INIT
U 1101, 0000,003C,05C0,0A78,0084,7001           1101:   SC_K[.1],Q_R[OF],J/TRPHO        ; DATA UNALIGNED
U 1102, 0000,003C,09C0,0A78,0084,7001           1102:   SC_K[.2],Q_R[OF],J/TRPHO        ; X PAGE ERROR
U 1103, 0000,003C,0DC0,0A78,0084,7001           1103:   SC_K[.3],Q_R[OF],J/TRPHO        ; TB MODIFY
U 1104, 0000,003C,11C0,0A78,0084,7001           1104:   SC_K[.4],Q_R[OF],J/TRPHO        ; TB PROT ERROR
U 1105, 0000,003C,D5C0,0A78,0084,7001           1105:   SC_K[.6],Q_R[OF],J/TRPHO        ; TB MISS
U 1106, 0000,003C,D9C0,0A78,0084,7001           1106:   SC_K[.9],Q_R[OF],J/TRPHO        ; RES FLOAT OPER
U 1107, 0000,003C,5DC0,0A78,0084,7001           1107:   SC_K[.7],Q_R[OF],J/TRPHO        ; TB PARITY
U 1108, 0000,003C,01C0,0A78,0084,7001           1108:   SC_K[.8],Q_R[OF],J/TRPHO        ; CACHE PARITY
U 110C, 0000,003C,85C0,0A78,0084,7001           110C:   SC_K[.C],Q_R[OF],J/TRPHO        ; RDS
U 110D, 0000,003C,89C0,0A78,0084,7001           110D:   SC_K[.D],Q_R[OF],J/TRPHO        ; TIME OUT
U 110E, 0000,003C,65C0,0A78,0084,7001           110E:   SC_K[.10],Q_R[OF],J/TRPHO       ; ODD ADDRESS
U 110F, 0000,003C,61C0,0A78,0084,71FA           110F:   SC_K[.F],Q_R[OF],J/TRPH2        ; CS PARITY

U 1001, 0001,2024,0180,0800,0010,104F           TRPHO:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 104F, 0000,013C,0180,0800,0000,1002                   Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000           =0      ALU_Q[AND]MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN


                                                ;+
                                                ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                                ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                                ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                                ;
                                                ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                                ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                                ;             FAULT STATUS REGISTER
                                                ;             SBI ERROR REGISTER
                                                ;             TIMEOUT ADDRESS REGISTER
                                                ;             MAINTENANCE REGISTER
```

```
                                        ;1861   ;             CACHE PARITY REGISTER
                                        ;1862   ;             TB ERROR REGISTER 1
                                        ;1863   ;             TB ERROR REGISTER 0
                                        ;1864   ;-
                                        ;1865
U 1003, 0018,0038,1D80,09E8,0000,1004   ;1866   TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,7231   ;1867   =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,105B   ;1868           Q_ID[TBER0]
U 105B, 0001,203C,4DF0,2DB0,0000,105F   ;1869           RC[6]_Q,Q_ID[TBER1]
U 105F, 0001,203C,65F0,2DB8,0000,1109   ;1870           RC[7]_Q,Q_ID[SBI.ERR]
U 1109, 0001,203C,6DF0,2DD8,0000,11F6   ;1871           RC[0B]_Q,Q_ID[FAULT]
U 11F6, 0001,203C,75F0,2DE0,0000,11F7   ;1872           RC[0C]_Q,Q_ID[MAINT]
U 11F7, 0001,203C,79F0,2DC8,0000,11F8   ;1873           RC[9]_Q,Q_ID[PARITY]
U 11F8, 0001,203C,69F0,2DC0,0000,11F9   ;1874           RC[8]_Q,Q_ID[TIME.ADDR]
U 11F9, 0001,203C,81F0,2DD0,0000,1000   ;1875           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1216   ;1876   1000:   RC[0E]_Q,ERROR1
                                        ;1877
                                        ;1878   ;+
                                        ;1879   ; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
                                        ;1880   ;-
                                        ;1881
U 11FA, 0001,2024,0180,0800,0010,11FB   ;1882   TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS THE TRAP EXPECTED?
U 11FB, 0000,013C,0180,0800,0000,1006   ;1883           Z?                              ; BRANCH IF NO
U 1006, 0001,2036,0180,0AF8,0000,0001   ;1884   =0      ALU_Q[AND]MASK,R[0F]_ALU,RETURN1 ; RETURN
U 1007, 0000,003C,0180,0800,0000,1003   ;1885           J/TRPH1                         ; REPORT UNEXPECTED TRAP
                                        ;1886
                                        ;1887
                                        ;1888   ;+
                                        ;1889   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1890   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1891   ;               NEWTST
                                        ;1892   ;               ERLOOP
                                        ;1893   ;               ERROR1
                                        ;1894   ;               ERROR2
                                        ;1895   ;
                                        ;1896
U 11FC, 0000,003C,65F8,0800,0084,71FD   ;1897   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 11FD, 0818,0038,8D80,0800,0000,11FE   ;1898           D_K[.1F]                        ; ...
U 11FE, 0D00,003C,0180,0800,0000,11FF   ;1899           D_DAL.SC
U 11FF, 0000,003C,3D80,3C00,0000,1201   ;1900           ID[PSL]_D                       ; WRITE THE PSL
U 1201, 0818,0038,0580,0800,0000,1203   ;1901           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 1203, 0D00,003C,0180,0800,0000,1205   ;1902           D_DAL.SC
U 1205, 0F00,003C,3180,3C00,0000,1207   ;1903           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 1207, 0000,003C,5D80,3C00,0000,1209   ;1904           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 1209, 0000,003C,3980,3C00,0000,120A   ;1905           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 120A, 0000,003C,2980,3C00,0000,120B   ;1906           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 120B, 0000,003C,4980,3C00,0000,120C   ;1907           ID[TBER0]_D                     ; SHUT OFF THE TB
U 120C, 0000,003C,7180,3C00,0000,120D   ;1908           ID[COMP]_D                      ; CLEAR SILO COMPARATOR
U 120D, 0818,0038,C180,0800,0000,120E   ;1909           D_K[.FFFF]
U 120E, 0000,003C,6580,3C00,0000,120F   ;1910           ID[SBI.ERR]_D
U 120F, 0F00,003C,6D80,3C00,0000,1210   ;1911           ID[FAULT]_D,D_0
U 1210, 0000,003C,6D80,3C00,0000,1211   ;1912           ID[FAULT]_D
U 1211, 0000,003C,6580,3C00,0000,1212   ;1913           ID[SBI.ERR]_D
U 1212, 0003,003C,0180,09F0,0000,1213   ;1914           RC[0E]_0
U 1213, 0003,003C,0180,0AF8,0000,1214   ;1915           R[0F]_0
```

```
U 1214, 0003,003C,0180,09E8,0000,105E   ;1916           RC[OD]_0,J/CALLCON              ; CALL THE CONSOLE
U 1215, 0818,0038,0980,0800,0000,105E   ;1917   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 1216, 0810,0038,0180,0978,0000,1217   ;1918   ERROR1: D_RC[OF]
U 1217, 0819,0034,4D80,0800,0000,104E   ;1919           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1920   104E:   D_D.OR.K[.4],J/CALLCON
                                        ;1921
U 1218, 0810,0038,0180,0978,0000,1219   ;1922   ERROR2: D_RC[OF]
U 1219, 0819,0034,4D80,0800,0000,105A   ;1923           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1924   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1925
                                        ;1926   105E:
                                        ;1927   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1928           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1929
                                        ;1930   ;+
                                        ;1931   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1932   ;-
                                        ;1933
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1934   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1935   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1936   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1937   13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1938   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1939   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1940   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1941   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1942   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1943   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1944   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1945   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1946   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1947   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1948   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,121A   ;1949   13FF:   NOP
                                        ;1950
                                        ;1951
                                        ;1952   ;+
                                        ;1953   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
                                        ;1954   ; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
                                        ;1955   ; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
                                        ;1956   ; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
                                        ;1957   ;
                                        ;1958   ; FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
                                        ;1959   ;       THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
                                        ;1960   ;
                                        ;1961   ;               =0      D_0,CALL,J/DC5
                                        ;1962   ;                       NOP
                                        ;1963   ;               =0      CALL,J/DC5
                                        ;1964   ;-
                                        ;1965
U 121A, 0018,0038,1980,0800,0000,122A   ;1966   DC0:    ALU_O(K),J/S00
U 121B, 0018,0038,1980,0800,0000,122B   ;1967   DC1:    ALU_O(K),J/S01
U 121C, 0018,0038,1980,0800,0000,122C   ;1968   DC2:    ALU_O(K),J/S10
U 121D, 0018,0038,1980,0800,0000,122D   ;1969   DC3:    ALU_O(K),J/S11
U 121E, 0018,0038,0980,0800,0000,122A   ;1970   DC4:    ALU_K[.2],J/S00
```

```
U 121F, 0018,0038,0980,0800,0000,122B   ;1971   DC5:    ALU_K[.2],J/S01
U 1220, 0018,0038,0980,0800,0000,122C   ;1972   DC6:    ALU_K[.2],J/S10
U 1221, 0018,0038,0980,0800,0000,122D   ;1973   DC7:    ALU_K[.2],J/S11
U 1222, 0018,0038,0580,0800,0000,122A   ;1974   DC8:    ALU_K[.1],J/S00
U 1223, 0018,0038,0580,0800,0000,122B   ;1975   DC9:    ALU_K[.1],J/S01
U 1224, 0018,0038,0580,0800,0000,122C   ;1976   DCA:    ALU_K[.1],J/S10
U 1225, 0018,0038,0580,0800,0000,122D   ;1977   DCB:    ALU_K[.1],J/S11
U 1226, 0018,0038,C180,0800,0000,122A   ;1978   DCC:    ALU_K[.FFFF],J/S00
U 1227, 0018,0038,C180,0800,0000,122B   ;1979   DCD:    ALU_K[.FFFF],J/S01
U 1228, 0018,0038,C180,0800,0000,122C   ;1980   DCE:    ALU_K[.FFFF],J/S10
U 1229, 0018,0038,C180,0800,0000,122D   ;1981   DCF:    ALU_K[.FFFF],J/S11
                                        ;1982
U 122A, 0118,0038,1B80,0800,0000,122E   ;1983   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 122B, 0118,0038,0B80,0800,0000,122E   ;1984   S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 122C, 0118,0038,0780,0800,0000,122E   ;1985   S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 122D, 0118,0038,C380,0800,0000,122E   ;1986   S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
                                        ;1987
U 122E, 0100,003E,0380,0800,0000,0001   ;1988   SX:     D_D.LEFT2,SI/7,RETURN1          ; EXIT
                                        ;1989
                                        ;1990
                                        ;1991   ;+
                                        ;1992   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                        ;1993   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                        ;1994   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                        ;1995   ; TYPING IT.
                                        ;1996   ;-
                                        ;1997
U 122F, 0810,0038,4D80,0978,0000,1230   ;1998   SUBTST: D_RC[OF],KMX/.FF00
U 1230, 0019,4016,4D80,09F8,0000,0001   ;1999           RC[OF]_D+K[.FF00],WORD,RETURN1
                                        ;2000
                                        ;2001   ;+
                                        ;2002   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                        ;2003   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                        ;2004   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                        ;2005   ;-
                                        ;2006
U 1231, 0010,0038,01C0,0978,0000,1232   ;2007   SETRCF: Q_RC[OF]
U 1232, 0019,2034,4DC0,0800,0000,1233   ;2008           Q_Q.AND.K[.FF00]
U 1233, 0019,2032,1D80,09F8,0000,0001   ;2009           RC[OF]_Q.OR.SC,RETURN1
                                        ;2010
```

```
                                                  
                                                  ;+
                                                  ; THE FOLLOWING 15 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
                                                  ; THE INSTRUCTION AT LOCATION ''DISPAT'' LOADS THE Q REGISTER WITH HEX 100
                                                  ; AND THEN EXECUTES THE CALL 3.
                                                  ;-

                                                  SYNC00:
U 1234, 0038,003B,41C0,0800,0000,1200             DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/1200


U 1200, 0000,003E,0180,0800,0000,0001             1200:   RETURN1
U 1202, 0000,003E,0180,0800,0000,0001             1202:   RETURN1
U 1204, 0000,003E,0180,0800,0000,0001             1204:   RETURN1
U 1206, 0000,003E,0180,0800,0000,0001             1206:   RETURN1
U 1208, 0000,003E,0180,0800,0000,0001             1208:   RETURN1
U 1245, 0000,003E,0180,0800,0000,0001             1245:   RETURN1
U 1247, 0000,003E,0180,0800,0000,0001             1247:   RETURN1
U 124F, 0000,003E,0180,0800,0000,0001             124F:   RETURN1
U 1251, 0000,003E,0180,0800,0000,0001             1251:   RETURN1
U 1253, 0000,003E,0180,0800,0000,0001             1253:   RETURN1
U 1257, 0000,003E,0180,0800,0000,0001             1257:   RETURN1
U 128F, 0000,003E,0180,0800,0000,0001             128F:   RETURN1
U 12B8, 0000,003E,0180,0800,0000,0001             12B8:   RETURN1
U 12BB, 0000,003E,0180,0800,0000,0001             12BB:   RETURN1
U 12AA, 0000,003C,0180,0800,0000,1235             12AA:   NOP             ; THIS LOCATION IS ECO'D TO 1155

                                                  ;+
                                                  ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
                                                  ; CACHE REFERANCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
                                                  ; IS COMPLETELY FULL OF DATA.
                                                  ;
                                                  ; BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
                                                  ;-

U 1235, 3000,003C,0180,6000,0000,1236             IBWAIT: LOAD.IB,IBC/START
U 1236, 0000,003C,0180,F800,0000,1237                     MCT/ALLOW.IB.READ
U 1237, 0000,003C,0180,F800,0000,1238                     MCT/ALLOW.IB.READ
U 1238, 0000,003C,0180,F800,0000,1239                     MCT/ALLOW.IB.READ
U 1239, 0000,003C,0180,F800,0000,123A                     MCT/ALLOW.IB.READ
U 123A, 0000,003C,0180,F800,0000,123B                     MCT/ALLOW.IB.READ
U 123B, 1000,003E,0180,F800,0000,0001                     MCT/ALLOW.IB.READ,IBC/STOP,RETURN1


                                                  GETDATA:
U 123C, 0000,003C,0180,0A10,0200,123D                     VA_R[2]                      ; LOAD ADR OF AMX DATA
U 123D, 0000,003C,0180,C800,0000,123E                     D[LONG]_CACHE.P              ; FETCH
U 123E, 0001,003C,0180,0A80,0000,123F                     R[0]_D                       ; SAVE
U 123F, 0000,003C,0180,0A18,0200,1240                     VA_R[3]                      ; LOAD ADR OF BMX DATA
U 1240, 0000,003C,0180,C800,0000,1241                     D[LONG]_CACHE.P              ; FETCH
U 1241, 0001,003C,0180,0980,0000,1242                     RC[0]_D                      ; SAVE
U 1242, 0000,003C,0180,0A20,0200,1243                     VA_R[4]                      ; LOAD ADR OF EXP DATA
U 1243, 0000,803C,0180,C800,0000,1244                     D[BYTE]_CACHE.P              ; FETCH
U 1244, 0019,0034,4980,09F0,0000,1010                     RC[0E]_D.AND.K[.FF]          ; SAVE
U 1010, 2000,003D,0180,0A08,4200,1235             =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
```

```
U 1011, 0000,003C,0180,0800,0000,1012   ;2066           NOP
U 1012, 0000,003D,0180,0800,0000,1234   ;2067   =0      CALL,J/DISPAT                   ; LOAD THE DATA TYPE LATCH
U 1013, 0000,003E,0180,0800,0000,0001   ;2068           RETURN1
                                        ;2069
                                        ;2070
                                        ;2071   INITVBIT:
U 1246, 0813,001C,0180,0970,0000,1248   ;2072           D_NOT.RC[0E]                    ; GET COMPLIMENT EXP DATA
U 1248, 0819,0034,0980,0800,0000,1249   ;2073           D_D.AND.K[.2]                   ; MASK
U 1249, 0000,003C,3DF0,2C00,0000,124A   ;2074           Q_ID[PSL]                       ; READ THE PSL
U 124A, 0019,2034,09C0,0800,0000,124B   ;2075           Q_Q.AND.K[.2]                   ; MASK THE V BIT
U 124B, 081D,0030,0180,0800,0000,124C   ;2076           D_D.OR.Q                        ; INSER T CC'S
U 124C, 0000,003C,3D80,3E00,0000,124D   ;2077           ID[PSL]_D,LAB_R[0]              ; LOAD THE V BIT
U 124D, 0810,0038,0180,097C,0000,124E   ;2078           D_RC[0E]                        ; GET EXPECTED DATA
U 124E, 0000,003E,0180,0900,0000,0001   ;2079           LC_RC[0],RETURN1                ; LATCH BMX DATA
                                        ;2080
                                        ;2081
                                        ;2082   INITNBIT:
U 1250, 0813,001C,0180,0970,0000,1252   ;2083           D_NOT.RC[0E]                    ; GET COMPLIMENT EXP DATA
U 1252, 0819,0034,0180,0800,0000,1254   ;2084           D_D.AND.K[.8]                   ; MASK
U 1254, 0000,003C,3DF0,2C00,0000,1255   ;2085           Q_ID[PSL]                       ; READ THE PSL
U 1255, 0019,2034,01C0,0800,0000,1256   ;2086           Q_Q.AND.K[.8]                   ; MASK THE N BIT
U 1256, 081D,0030,0180,0800,0000,1258   ;2087           D_D.OR.Q                        ; INSERT N BIT
U 1258, 0000,003C,3D80,3E00,0000,1259   ;2088           ID[PSL]_D,LAB_R[0]              ; LOAD THE N BIT
U 1259, 0810,0038,0180,0970,0000,125A   ;2089           D_RC[0E]                        ; GET EXPECTED DATA
U 125A, 0000,003E,0180,0900,0000,0001   ;2090           LC_RC[0],RETURN1                ; LATCH BMX DATA
                                        ;2091
                                        ;2092
U 125B, 0000,003C,3DF0,2C00,0000,125C   ;2093   SETCM:  Q_ID[PSL]
U 125C, 0000,003C,8D80,0800,0084,725D   ;2094           SC_K[.1F]
U 125D, 0803,001C,0180,0800,0000,125E   ;2095           D_NOT.MASK
U 125E, 081D,0030,0180,0800,0000,125F   ;2096           D_D.OR.Q
U 125F, 0000,003E,3D80,3C00,0000,0001   ;2097           ID[PSL]_D,RETURN1
                                        ;2098
                                        ;2099
                                        ;2100   =000
                                        ;2101   IBBRTABLE:
U 1008, 0000,003E,01F8,0800,0000,0001   ;2102           Q_0,RETURN1
U 1009, 0018,003A,05C0,0800,0000,0001   ;2103           Q_K[.1],RETURN1
U 100A, 0018,003A,09C0,0800,0000,0001   ;2104           Q_K[.2],RETURN1
U 100B, 0018,003A,0DC0,0800,0000,0001   ;2105           Q_K[.3],RETURN1
U 100C, 0018,003A,11C0,0800,0000,0001   ;2106   REIENT: Q_K[.4],RETURN1
U 100D, 0018,0038,11C0,0800,0000,1260   ;2107           Q_K[.4],J/ADDONE
U 100E, 0018,003A,D5C0,0800,0000,0001   ;2108           Q_K[.6],RETURN1
U 100F, 0018,003A,5DC0,0800,0000,0001   ;2109           Q_K[.7],RETURN1
U 1260, 0019,2016,05C0,0800,0000,0001   ;2110   ADDONE: Q_Q+K[.1],RETURN1
                                        ;2111
                                        ;2112
                                        ;2113   .PAGE   "TEST 146       INSTRUCTION DEPENDENT COND CODE LOAD (Z BIT)"
                                        ;2114   ;***********************************************************************
                                        ;2115   ;++
                                        ;2116   ; TEST  146     INSTRUCTION DEPENDENT Z BIT
                                        ;2117   ;
                                        ;2118   ; TEST DESCRIPTION
                                        ;2119   ;       THIS TEST CHECKS THE Z SELECT CODE OF 2 BY FLOATING A ZERO ACCROSS
                                        ;2120   ;       THE OUTPUT OF THE ALU AND CHECKING THAT THE Z BIT DOES NOT SET, AND
                                        ;2121   ;       THEN MAKING THE ALU OUTPUT ALL ONE'S AND CHECKING THAT THE Z BIT
                                        ;2122   ;       SETS.
                                        ;2123   ;
                                        ;2124   ;       SUBTST 1 - CHECK THE FUNCTION WITH DATA TYPE BYTE
                                        ;2125   ;       SUBTST 2 - CHECK THE FUNCTION WITH DATA TYPE WORD
                                        ;2126   ;       SUBTST 3 - CHECK THE FUNCTION WITH DATA TYPE LONG
                                        ;2127   ;
                                        ;2128   ; LOGIC DESCRIPTION
                                        ;2129   ;       THIS TEST CHECKS PART OF THE INSTRUCTION DEPENDENT CONDITION CODE
                                        ;2130   ;       PROM, PART OF THE ZN PROM, PART OF THE MULTIPLEXOR THAT FEEDS
                                        ;2131   ;       THE Z DATA SIGNAL, AND THE GATE THAT GENERATES THE "A=B" SIGNAL
                                        ;2132   ;       ON THE CEH MODULE.
                                        ;2133   ;
                                        ;2134   ; ERROR DESCRIPTION
                                        ;2135   ;       DATA: EXPECTED CONDITION CODES
                                        ;2136   ;             RECEIVED CONDITION CODES
                                        ;2137   ;             LOOP COUNT -- DESCRIBES WHICH BIT POSITION THE FLOATING ZERO
                                        ;2138   ;               IS CURRENTLY IN, I.E.:
                                        ;2139   ;               SUBTST 1 - 9=BIT 0, 8=BIT 1, ..., 1=BIT 8
                                        ;2140   ;               SUBTST 2 - 11=BIT 0, 10=BIT 1, ..., 1=BIT 16
                                        ;2141   ;               SUBTST 3 - 21=BIT 0, 20=BIT 1, ..., 1=BIT 32 (ALL ONES)
                                        ;2142   ;
                                        ;2143   ; SYNC POINT DESCRIPTION
                                        ;2144   ;       SUBTST 1 - SYNCA0--Z BIT CLOCKS
                                        ;2145   ;       SUBTST 2 - SYNCA1--Z BIT CLOCKS
                                        ;2146   ;       SUBTST 3 - SYNCA2--Z BIT CLOCKS
                                        ;2147   ;--
                                        ;2148   ;***********************************************************************
                                        ;2149   =0
U 1014, 0018,0039,0D80,09F8,0000,11FC   ;2150   T146:   NEWTST[.3]
U 1015, 0018,0038,1180,0A90,0000,1016   ;2151           R[2]_K[.4]                      ; INITIAL VALUE FOR Z BIT
U 1016, 0818,0039,6580,0800,0000,121A   ;2152   =0      D_K[.10],CALL,J/DCO             ; GEN ADR OF IB DATA
U 1017, 0001,003C,0180,0A88,0000,1261   ;2153           R[1]_D                          ; EQUALS 100(16)
U 1261, 0018,0000,0580,0A80,0000,1262   ;2154           R[0]_0-K[.1]                    ; ALEG DATA
U 1262, 0018,0000,0580,0980,0000,1263   ;2155           RC[0]_0-K[.1]                   ; BLEG DATA
U 1263, 0003,003C,0180,09F0,0000,1264   ;2156           RC[0E]_0                        ; INIT EXPECTED DATA
                                        ;2157
                                        ;2158
                                        ;2159   ;///////////////////////////////////////////////////////////////////////
                                        ;2160   ;+
                                        ;2161   ; Z SET WHEN ALEG=BLEG, DATA TYPE BYTE
                                        ;2162   ;-
                                        ;2163
U 1264, 0018,0038,D980,09E0,0000,1018   ;2164   T146S1: RC[0C]_K[.9]                    ; SET THE LOOP COUNT
U 1018, 0000,003D,0180,0800,0000,122F   ;2165   =0      SUBTEST
U 1019, 0000,003C,0180,0800,0000,101A   ;2166           NOP
U 101A, 2000,003D,0180,0A08,4200,1235   ;2167   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LAOD THE IB
```

```
U 101B, 0000,003C,0180,0800,0000,101C              NOP
U 101C, 0000,003D,0180,0800,0000,1234      =0      CALL,J/DISPAT                   ; LATCH THE DATA TYPE
U 101D, 0000,003C,0180,0800,0000,101E              NOP
U 101E, 0000,003D,0180,0800,0000,1215      =0      ERLOOP
U 101F, 0800,003C,0180,0A10,0000,1265      T146L1:D_R[2]
U 1265, 0000,003C,3DF0,2C00,0000,1266              Q_ID[PSL]
U 1266, 0019,2024,61C0,0800,0000,1267              Q_Q.ANDNOT.K[.F]
U 1267, 081D,0030,0180,0800,0000,1268              D_D.OR.Q
U 1268, 0000,003C,3DE0,3E00,0000,1269              ID[PSL]_D,LAB_R[0]              ; INIT THE Z BIT
U 1269, 0810,0038,0180,0970,0000,126A              D_RC[0E]                        ; GET EXPECTED VALUE
U 126A, 0000,003C,0180,0900,0000,126B              LC_RC[0]                        ; LATCH THE BLEG DATA
U 126B, 0010,C014,0180,0800,0070,126C      SYNCA0: ALU_LA+LC,SET.CC(INST)          ; EXECUTE TEH TEST
U 126C, 0000,003C,3DF0,2C00,0000,126D              Q_ID[PSL]
U 126D, 0019,2034,11C0,0800,0000,126E              Q_Q.AND.K[.4]                   ; MASK THE Z BIT
U 126E, 001D,A000,0180,0800,0010,126F              ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 126F, 0000,013C,0180,0800,0000,1020              Z?
U 1020, 0001,203D,0180,09E8,0000,1218      =0      ERROR2,RC[0D]_Q

                                           ;+
                                           ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                           ;-

U 1021, 0810,0038,0180,0900,0000,1270              D_RC[0]                         ; GET BLEG DATA
U 1270, 0500,003C,0180,0800,0000,1271              D_D.LEFT,SI/ZERO                ; SHIFT SO ZERO FLOATS TO NEXT BIT
U 1271, 0001,003C,0180,0980,0000,1272              RC[0]_D
U 1272, 0810,0038,0180,0960,0000,1273              D_RC[0C]                        ; GET THE LOOP COUNT
U 1273, 0019,8000,0980,0800,0010,1274              ALU_D-K[.2],CLK.UBCC,BYTE       ; TIME FOR A=B?
U 1274, 0000,013C,0180,0800,0000,1022              Z?
U 1022, 0000,003C,0180,0800,0000,1276      =0      J/T146P1                        ; NO
U 1023, 0018,0038,1180,09F0,0000,1275              RC[0E]_K[.4]                    ; SET EXPECTED VALUE
U 1275, 0003,003C,0180,0A90,0000,1276              R[2]_0                          ; SET INITIAL VALUE
U 1276, 0019,8000,0580,09E0,0010,1277      T146P1: RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 1277, 0000,013C,0180,0800,0000,1024              Z?
U 1024, 0000,003C,0180,0800,0000,101F      =0      J/T146L1


                                           ;//////////////////////////////////////////////////////////////////////
                                           ;+
                                           ; Z BIT SETS WHEN A=B, DATA TYPE WORD
                                           ;-

U 1025, 0000,003C,0180,0A08,0000,1278      T146S2: LAB_R[1]
U 1278, 0018,0014,1180,0A88,0000,1026              R[1]_LA+K[.4]                   ; INCREMENT ADR OF IB DATA
U 1026, 0000,003D,0180,0800,0000,122F      =0      SUBTEST
U 1027, 001B,0000,0580,0980,0000,1279              RC[0]_0-K[.1]                   ; INIT BLEG DATA
U 1279, 0018,0038,1180,0A90,0000,127A              R[2]_K[.4]                      ; INITIAL VALUE OF Z BIT
U 127A, 0003,003C,0180,09F0,0000,127B              RC[0E]_0                        ; EXPECTED VALUE OF Z BIT
U 127B, 0818,0038,6580,0800,0000,127C              D_K[.10]
U 127C, 0019,0014,0580,09E0,0000,1028              RC[0C]_D+K[.1]                  ; SET THE LOOP COUNT
U 1028, 2000,003D,0180,0A08,4200,1235      =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1029, 0000,003C,0180,0800,0000,102A              NOP
U 102A, 0000,003D,0180,0800,0000,1234      =0      CALL,J/DISPAT                   ; LOAD THE DATA TYPE LATCH
U 102B, 0000,003C,0180,0800,0000,102C              NOP
U 102C, 0000,003D,0180,0800,0000,1215      =0      ERLOOP
U 102D, 0800,003C,0180,0A10,0000,127D      T146L2: D_R[2]
```

```
U 127D, 0000,003C,3DF0,2C00,0000,127E    ;2223              Q_ID[PSL]
U 127E, 0019,2024,61C0,0800,0000,127F    ;2224              Q_Q.ANDNOT.K[.F]
U 127F, 081D,0030,0180,0800,0000,1280    ;2225              D_D.OR.Q
U 1280, 0000,003C,3D80,3E00,0000,1281    ;2226              ID[PSL]_D,LAB_R[0]                ; INIT THE Z BIT
U 1281, 0810,0038,0180,0970,0000,1282    ;2227              D_RC[0E]                          ; GET EXPECTED VALUE
U 1282, 0000,003C,0180,0900,0000,1283    ;2228              LC_RC[0]                          ; LATCH THE BLEG DATA
U 1283, 0010,C014,0180,0800,0070,1284    ;2229     SYNCA1:  ALU_LA+LC,SET.CC(INST)            ; EXECUTE TEH TEST
U 1284, 0000,003C,3DF0,2C00,0000,1285    ;2230              Q_ID[PSL]
U 1285, 0019,2034,11C0,0800,0000,1286    ;2231              Q_Q.AND.K[.4]                     ; MASK THE Z BIT
U 1286, 001D,A000,0180,0800,0010,1287    ;2232              A[U_Q-D,CLK.UBCC,BYTE             ; CHECK
U 1287, 0000,013C,0180,0800,0000,102E    ;2233              Z?
U 102E, 0001,203D,0180,09E8,0000,1218    ;2234     =0       ERROR2,RC[0D]_Q
                                         ;2235
                                         ;2236     ;+
                                         ;2237     ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                         ;2238     ;-
                                         ;2239
U 102F, 0810,0038,0180,0900,0000,1288    ;2240              D_RC[0]                           ; GET BLEG DATA
U 1288, 0500,003C,0180,0800,0000,1289    ;2241              D_D.LEFT,SI/ZERO                  ; SHIFT SO ZERO FLOATS TO NEXT BIT
U 1289, 0001,003C,0180,0980,0000,128A    ;2242              RC[0]_D
U 128A, 0810,0038,0180,0960,0000,128B    ;2243              D_RC[0C]                          ; GET THE LOOP COUNT
U 128B, 0019,8000,0980,0800,0010,128C    ;2244              A[U_D-K[.2],CLK.UBCC,BYTE         ; TIME FOR A=B?
U 128C, 0000,013C,0180,0800,0000,1030    ;2245              Z?
U 1030, 0000,003C,0180,0800,0000,128E    ;2246     =0       J/T146P2                          ; NO
U 1031, 0018,0038,1180,09F0,0000,128D    ;2247              RC[0E]_K[.4]                      ; SET EXPECTED VALUE
U 128D, 0003,003C,0180,0A90,0000,128E    ;2248              R[2]_0                            ; SET INITIAL VALUE
U 128E, 0019,8000,0580,09E0,0010,1290    ;2249     T146P2:  RC[0C]_D-K[.1],CLK.UBCC,BYTE      ; DECREMENT LOOP COUNT
U 1290, 0000,013C,0180,0800,0000,1032    ;2250              Z?
U 1032, 0000,003C,0180,0800,0000,102D    ;2251     =0       J/T146L2
                                         ;2252
                                         ;2253
                                         ;2254     ;//////////////////////////////////////////////////////////////////////
                                         ;2255     ;+
                                         ;2256     ; Z BIT SETS WHEN A=B, DATA TYPE LONG
                                         ;2257     ;-
                                         ;2258
U 1033, 0000,003C,0180,0A08,0000,1291    ;2259     T146S3:  LAB_R[1]
U 1291, 0018,0014,1180,0A88,0000,1034    ;2260              R[1]_LA+K[.4]
U 1034, 0000,003D,0180,0800,0000,122F    ;2261     =0       SUBTEST
U 1035, 001B,0000,0580,0980,0000,1292    ;2262              RC[0]_0-K[.1]                     ; INIT BLEG DATA
U 1292, 0018,0038,1180,0A90,0000,1293    ;2263              R[2]_K[.4]                        ; INITIAL VALUE OF Z BIT
U 1293, 0003,003C,0180,09F0,0000,1294    ;2264              RC[0E]_0                          ; EXPECTED VALUE OF Z BIT
U 1294, 0818,0038,7580,0800,0000,1295    ;2265              D_K[.20]
U 1295, 0019,0014,0580,09E0,0000,1036    ;2266              RC[0C]_D+K[.1]                    ; SET THE LOOP COUNT
U 1036, 2000,003D,0180,0A08,4200,1235    ;2267     =0       ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1037, 0000,003C,0180,0800,0000,1038    ;2268              NOP
U 1038, 0000,003D,0180,0800,0000,1234    ;2269     =0       CALL,J/DISPAT                     ; LOAD THE DATA TYPE LATCH
U 1039, 0000,003C,0180,0800,0000,103A    ;2270              NOP
U 103A, 0000,003D,0180,0800,0000,1215    ;2271     =0       ERLOOP
U 103B, 0800,003C,0180,0A10,0000,1296    ;2272     T146L3:  D_R[2]
U 1296, 0000,003C,3DF0,2C00,0000,1297    ;2273              Q_ID[PSL]
U 1297, 0019,2024,61C0,0800,0000,1298    ;2274              Q_Q.ANDNOT.K[.F]
U 1298, 081D,0030,0180,0800,0000,1299    ;2275              D_D.OR.Q
U 1299, 0000,003C,3D80,3E00,0000,129A    ;2276              ID[PSL]_D,LAB_R[0]                ; INIT THE Z BIT
U 129A, 0810,0038,0180,0970,0000,129B    ;2277              D_RC[0E]                          ; GET EXPECTED VALUE
```

```
U 129B, 0000,003C,0180,0900,0000,129C   ;2278            LC_RC[0]                         ; LATCH THE BLEG DATA
U 129C, 0010,C014,0180,0800,0070,129D   ;2279   SYNCA2:  ALU_LA+LC,SET.CC(INST)           ; EXECUTE TEH TEST
U 129D, 0000,003C,3DF0,2C00,0000,129E   ;2280            Q_ID[PSL]
U 129E, 0019,2034,11C0,0800,0000,129F   ;2281            Q_Q.AND.K[.4]                    ; MASK THE Z BIT
U 129F, 001D,A000,0180,0800,0010,12A0   ;2282            A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 12A0, 0000,013C,0180,0800,0000,103C   ;2283            Z?
U 103C, 0001,203D,0180,09E8,0000,1218   ;2284   =0       ERROR2,RC[0D]_Q
                                        ;2285
                                        ;2286   ;+
                                        ;2287   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;2288   ;-
                                        ;2289
U 103D, 0810,0038,0180,0900,0000,12A1   ;2290            D_RC[0]                          ; GET BLEG DATA
U 12A1, 0500,003C,0180,0800,0000,12A2   ;2291            D_D.LEFT,SI/ZERO                 ; SHIFT SO ZERO FLOATS TO NEXT BIT
U 12A2, 0001,003C,0180,0980,0000,12A3   ;2292            RC[0]_D
U 12A3, 0810,0038,0180,0960,0000,12A4   ;2293            D_RC[0C]                         ; GET THE LOOP COUNT
U 12A4, 0019,8000,0980,0800,0010,12A5   ;2294            A[U_D-K[.2],CLK.UBCC,BYTE        ; TIME FOR A=B?
U 12A5, 0000,013C,0180,0800,0000,103E   ;2295            Z?
U 103E, 0000,003C,0180,0800,0000,12A7   ;2296   =0       J/T146P3                         ; NO
U 103F, 0018,0038,1180,09F0,0000,12A6   ;2297            RC[0E]_K[.4]                     ; SET EXPECTED VALUE
U 12A6, 0003,003C,0180,0A90,0000,12A7   ;2298            R[2]_0                           ; SET INITIAL VALUE
U 12A7, 0019,8000,0580,09E0,0010,12A8   ;2299   T146P3:  RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT LOOP COUNT
U 12A8, 0000,013C,0180,0800,0000,1040   ;2300            Z?
U 1040, 0000,003C,0180,0800,0000,103B   ;2301   =0       J/T146L3
U 1041, 0000,003C,0180,0800,0000,1042   ;2302            NOP
                                        ;2303
                                        ;2304
                                        ;2305   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2306   ;% 100
                                        ;2307   ; SUBTST 1
                                        ;2308   ;$ 6091,0050
                                        ;2309   ; SUBTST 2
                                        ;2310   ;$ 60B1,0050
                                        ;2311   ; SUBTST 3
                                        ;2312   ;$ 60D1,0050
```

```
                                            ;2313   .PAGE   "TEST 147       INSTRUCTION DEPENDENT COND CODE LOAD (N BIT)"
                                            ;2314   ;*********************************************************************
                                            ;2315   ;++
                                            ;2316   ; TEST  147     INSTRUCTION DEPENDENT N BIT
                                            ;2317   ;
                                            ;2318   ; TEST DESCRIPTION
                                            ;2319   ;       THIS TEST CHECKS N SELECT CODES OF 1, 4, AND 5 WITH SELECTED
                                            ;2320   ;       OP CODES IN THE INSTRUCTION BUFFER, AND SELECTED DATA PATTERNS
                                            ;2321   ;       ON THE AMX AND BMX TO GENERATE THE CONDITIONS REQUIRED FOR THE
                                            ;2322   ;       N DATA LOGIC.
                                            ;2323   ;
                                            ;2324   ;       SUBTST 1 - CHECK THAT THE N BIT CLEARS WITH N SELECT 4.
                                            ;2325   ;       SUBTST 2 - CHECK N SELECT 5 WITH THOSE DATA PATTERNS REQUIRING
                                            ;2326   ;                  THE ALU TO EXECUTE AN AMX+BMX TO GENERATE THE REQUIRED
                                            ;2327   ;                  ALU DATA.
                                            ;2328   ;       SUBTST 3 - CHECK N SELECT 5 WITH THOSE DATA PATTERNS REQUIRING
                                            ;2329   ;                  THE ALU TO EXECUTE AN AMX.AND.BMX TO GENERATE THE REQUIRED
                                            ;2330   ;                  ALU DATA.
                                            ;2331   ;       SUBTST 4 - CHECK N SELECT 1 WITH A DATA TYPE QUAD TO CHECK THAT
                                            ;2332   ;                  THE ALU SIGN COMES FROM BIT 15.
                                            ;2333   ;
                                            ;2334   ; LOGIC DESCRIPTION
                                            ;2335   ;       THIS TEST CHECKS PART OF THE INSTRUCTION DEPENDENT CONDITION CODE
                                            ;2336   ;       PROM, PART OF THE ZN PROM, THE ALU SIGN MULTIPLEXOR WITH QUAD DATA
                                            ;2337   ;       TYPE, AND PART OF THE MULTIPLEXOR THAT FEEDS THE N DATA SIGNAL.
                                            ;2338   ;
                                            ;2339   ; ERROR DESCRIPTION
                                            ;2340   ;       DATA: EXPECTED CONDITION CODES
                                            ;2341   ;             RECEIVED CONDITION CODES
                                            ;2342   ;             LOOP COUNT - DESCRIBES WHICH DATA PATTERNS WERE BEING USED
                                            ;2343   ;               WHEN THE FAILURE OCCURRED. (SEE THE DATA TABLE AT THE
                                            ;2344   ;               END OF THIS TEST). NOT USED IN SUBTST 1.
                                            ;2345   ;
                                            ;2346   ; SYNC POINT DESCRIPTION
                                            ;2347   ;       SUBTST 1 - SYNC23--N BIT CLOCKS
                                            ;2348   ;       SUBTST 2 - SYNC24--N BIT CLOCKS
                                            ;2349   ;       SUBTST 3 - SYNC25--N BIT CLOCKS
                                            ;2350   ;       SUBTST 4 - SYNC26--N BIT CLOCKS
                                            ;2351   ;--
                                            ;2352   ;*********************************************************************
                                            ;2353   =0
U 1042, 0018,0039,0980,09F8,0000,11FC       ;2354   T147:   NEWTST[.2]
U 1043, 0818,0038,6580,0800,0000,1044       ;2355           D_K[.10]
U 1044, 0819,0015,0580,0800,0000,121A       ;2356   =0      D_D+K[.1],CALL,J/DCO            ; GEN ADR OF IB DATA 110
U 1045, 0001,003C,0180,0A88,0000,1046       ;2357           R[1]_D                          ; SAVE
U 1046, 0818,0039,2180,0800,0000,121A       ;2358   =0      D_K[.14],CALL,J/DCO             ; GEN ADR OF BMX DATA 140
U 1047, 0001,003C,0180,0A98,0000,12A9       ;2359           R[3]_D                          ; SAVE
U 12A9, 0818,0038,6580,0800,0000,1048       ;2360           D_K[.10]
U 1048, 0819,0015,0980,0800,0000,121A       ;2361   =0      D_D+K[.2],CALL,J/DCO            ; GEN ADR OF AMX DATA 120
U 1049, 0001,003C,0180,0A90,0000,12AB       ;2362           R[2]_D                          ; SAVE
U 12AB, 0818,0038,7D80,0800,0000,104A       ;2363           D_K[.18]
U 104A, 0819,0001,0980,0800,0000,121A       ;2364   =0      D_D-K[.2],CALL,J/DCO            ; GEN ADR OF EXP N DATA 160
U 104B, 0001,003C,0180,0AA0,0000,104C       ;2365           R[4]_D                          ; SAVE
                                            ;2366
                                            ;2367   ;/////////////////////////////////////////////////////////////////////
```

```
                                          ;2368    ;+
                                          ;2369    ; NSEL<2:0>=LHH,  PSL N_0
                                          ;2370    ;-
                                          ;2371
                                          ;2372    =0
U 104C, 0000,003D,0180,0800,0000,123C     ;2373    T147S1: CALL,J/GETDATA                   ; LOAD THE IB
U 104D, 0003,003C,0180,09F0,0000,1050     ;2374            RC[OE]_0                         ; SET EXPECTED VALUE OF N
U 1050, 0000,003D,0180,0800,0000,122F     ;2375    =0      SUBTEST
U 1051, 0000,003C,0180,0800,0000,1052     ;2376            NOP
U 1052, 0000,003D,0180,0800,0000,1215     ;2377    =0      ERLOOP
U 1053, 0818,0038,0180,0800,0000,12AC     ;2378            D_K[.8]
U 12AC, 0000,003C,3DF0,2C00,0000,12AD     ;2379            Q_ID[PSL]
U 12AD, 0019,2024,61C0,0800,0000,12AE     ;2380            Q_Q.ANDNOT.K[.F]
U 12AE, 081D,0030,0180,0800,0000,12AF     ;2381            D_D.OR.Q
U 12AF, 0000,003C,3D80,3C00,0000,12B0     ;2382            ID[PSL]_D                        ; SET N BIT
U 12B0, 0F00,C03C,0180,0800,0070,12B1     ;2383    SYNC23: D_0,SET.CC(INST)                 ; EXECUTE TEST FUNCTION
U 12B1, 0000,003C,3DF0,2C00,0000,12B2     ;2384            Q_ID[PSL]
U 12B2, 0019,2034,01C0,0800,0000,12B3     ;2385            Q_Q.AND.K[.8]                    ; MASK THE N BIT
U 12B3, 001D,A000,0180,0800,0010,12B4     ;2386            A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 12B4, 0000,013C,0180,0800,0000,1054     ;2387            Z?
U 1054, 0001,203D,0180,09E8,0000,1218     ;2388    =0      ERROR2,RC[OD]_Q
                                          ;2389
                                          ;2390
                                          ;2391    ;///////////////////////////////////////////////////////////////////
                                          ;2392    ;+
                                          ;2393    ; NSELECT<2:0>=LHL, ALU MUST DO AN AMX PLUS BMX TO GENERATE
                                          ;2394    ; CORRECT ALU DATA
                                          ;2395    ;-
                                          ;2396
U 1055, 0000,003C,0180,0A08,0000,12B5     ;2397    T147S2: LAB_R[1]
U 12B5, 0018,0014,1180,0A88,0000,1056     ;2398            R[1]_LA+K[.4]                    ; INCREMENT ADR OF IB DATA
U 1056, 0000,003D,0180,0800,0000,122F     ;2399    =0      SUBTEST
U 1057, 0000,003C,0180,0800,0000,1058     ;2400            NOP
U 1058, 0000,003D,0D80,0800,0084,7231     ;2401    =0      SETRCF[.3]
U 1059, 0018,0038,1180,09E0,0000,105C     ;2402            RC[OC]_K[.4]                     ; SET THE LOOP COUNT
                                          ;2403    =0
U 105C, 0000,003D,0180,0800,0000,123C     ;2404    T147L1: CALL,J/GETDATA                   ; LOAD THE IB
U 105D, 0000,003C,0180,0800,0000,1060     ;2405            NOP
U 1060, 0000,003D,0180,0800,0000,1215     ;2406    =0      ERLOOP
U 1061, 0000,003C,0180,0800,0000,1062     ;2407            NOP
U 1062, 0000,003D,0180,0800,0000,1250     ;2408    =0      CALL,J/INITNBIT                  ; SET COMPLIMENT N BIT
U 1063, 0010,C014,0180,0800,0070,12B6     ;2409    SYNC24: ALU_LA+LC,SET.CC(INST)           ; EXECUTE TEH TEST
U 12B6, 0000,003C,3DF0,2C00,0000,12B7     ;2410            Q_ID[PSL]
U 12B7, 0019,2034,01C0,0800,0000,12B9     ;2411            Q_Q.AND.K[.8]                    ; MASK THE N BIT
U 12B9, 001D,A000,0180,0800,0010,12BA     ;2412            A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 12BA, 0000,013C,0180,0800,0000,1064     ;2413            Z?
U 1064, 0001,203D,0180,09E8,0000,1218     ;2414    =0      ERROR2,RC[OD]_Q
                                          ;2415
                                          ;2416    ;+
                                          ;2417    ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                          ;2418    ;-
                                          ;2419
U 1065, 0000,003C,0180,0A10,0000,12BC     ;2420            LAB_R[2]
U 12BC, 0018,0014,1180,0A90,0000,12BD     ;2421            R[2]_LA+K[.4]                    ; INCREMENT ADR OF AMX DATA
U 12BD, 0000,003C,0180,0A18,0000,12BE     ;2422            LAB_R[3]
```

```
U 12BE, 0018,0014,1180,0A98,0000,12BF   ;2423           R[3]_LA+K[.4]                   ; INCREMENT ADR OF BMX DATA
U 12BF, 0000,003C,0180,0A20,0000,12C0   ;2424           LAB_R[4]
U 12C0, 0018,0014,0580,0AA0,0000,12C1   ;2425           R[4]_LA+K[.1]                   ; INCREMENT ADR OF EXP DATA
U 12C1, 0810,0038,C180,0960,0000,12C2   ;2426           D_RC[0C]
U 12C2, 0019,8000,0580,09E0,0010,12C3   ;2427           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT THE LOOP COUNT
U 12C3, 0000,013C,0180,0800,0000,1066   ;2428           Z?
U 1066, 0000,003C,0180,0800,0000,105C   ;2429   =0      J/T147L1
                                        ;2430
                                        ;2431
                                        ;2432   ;//////////////////////////////////////////////////////////////////////
                                        ;2433   ;+
                                        ;2434   ; NSELECT<2:0>=LHL, ALU MUST DO AMX .AND. BMX TO GET CORRECT ALU OUTPUT
                                        ;2435   ;-
                                        ;2436
U 1067, 0018,0038,0980,09E0,0000,1068   ;2437   T147S3: RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 1068, 0000,003D,0180,0800,0000,122F   ;2438   =0      SUBTEST
U 1069, 0000,003C,0180,0800,0000,106A   ;2439           NOP
                                        ;2440   =0
U 106A, 0000,003D,0180,0800,0000,123C   ;2441   T147L2: CALL,J/GETDATA                  ; LOAD THE IB
U 106B, 0000,003C,0180,0800,0000,106C   ;2442           NOP
U 106C, 0000,003D,0180,0800,0000,1215   ;2443   =0      ERLOOP
U 106D, 0000,003C,0180,0800,0000,106E   ;2444           NOP
U 106E, 0000,003D,0180,0800,0000,1250   ;2445   =0      CALL,J/INITNBIT                 ; SET COMPLIMENT N BIT
U 106F, 0010,C034,0180,0800,0070,12C4   ;2446   SYNC25: ALU_LA.AND.LC,SET.CC(INST)      ; EXECUTE TEH TEST
U 12C4, 0000,003C,3DF0,2C00,0000,12C5   ;2447           Q_IB[PSL]
U 12C5, 0019,2034,01C0,0800,0000,12C6   ;2448           Q_Q.AND.K[.8]                   ; MASK THE N BIT
U 12C6, 001D,A000,0180,0800,0010,12C7   ;2449           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 12C7, 0000,013C,0180,0800,0000,1070   ;2450           Z?
U 1070, 0001,203D,0180,09E8,0000,1218   ;2451   =0      ERROR2,RC[0D]_Q
                                        ;2452
                                        ;2453   ;+
                                        ;2454   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;2455   ;-
                                        ;2456
U 1071, 0000,003C,0180,0A10,0000,12C8   ;2457           LAB_R[2]
U 12C8, 0018,0014,1180,0A90,0000,12C9   ;2458           R[2]_LA+K[.4]                   ; INCREMENT ADR OF AMX DATA
U 12C9, 0000,003C,0180,0A18,0000,12CA   ;2459           LAB_R[3]
U 12CA, 0018,0014,1180,0A98,0000,12CB   ;2460           R[3]_LA+K[.4]                   ; INCREMENT ADR OF BMX DATA
U 12CB, 0000,003C,0180,0A20,0000,12CC   ;2461           LAB_R[4]
U 12CC, 0018,0014,0580,0AA0,0000,12CD   ;2462           R[4]_LA+K[.1]                   ; INCREMENT ADR OF EXP DATA
U 12CD, 0810,0038,0180,0960,0000,12CE   ;2463           D_RC[0C]
U 12CE, 0019,8000,0580,09E0,0010,12CF   ;2464           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT THE LOOP COUNT
U 12CF, 0000,013C,0180,0800,0000,1072   ;2465           Z?
U 1072, 0000,003C,0180,0800,0000,106A   ;2466   =0      J/T147L2
                                        ;2467
                                        ;2468
                                        ;2469   ;//////////////////////////////////////////////////////////////////////
                                        ;2470   ;+
                                        ;2471   ; NSELECT<2:0>HHL -- DATA TYPE QUAD
                                        ;2472   ;-
                                        ;2473
U 1073, 0018,0038,0980,09E0,0000,1074   ;2474   T147S4: RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 1074, 0000,003D,0180,0800,0000,122F   ;2475   =0      SUBTEST
U 1075, 0000,003C,0180,0A08,0000,12D0   ;2476           LAB_R[1]
U 12D0, 0018,0014,1180,0A88,0000,1076   ;2477           R[1]_LA+K[.4]                   ; INCREMENT ADR OF IB DATA
```

```
U 1076, 0000,003D,0180,0800,0000,123C   ;2478   =0      CALL,J/GETDATA                    ; LOAD THE IB AND GET DATA FOR ALU
U 1077, 0000,003C,0180,0800,0000,1078   ;2479           NOP
U 1078, 0000,003D,0180,0800,0000,1215   ;2480   =0      ERLOOP                            ;
U 1079, 0000,003C,0180,0800,0000,107A   ;2481   T147L3: NOP
U 107A, 0000,003D,0180,0800,0000,1250   ;2482   =0      CALL,J/INITNBIT                   ; SET THE COMPLIMENT N BIT
U 107B, 0010,C014,0180,0800,0070,12D1   ;2483   SYNC26: ALU_LA+LC,SET.CC(INST)            ; EXECUTE THE TEST
U 12D1, 0000,003C,3DF0,2C00,0000,12D2   ;2484           Q_ID[PSL]                         ; GET THE CC'S
U 12D2, 0019,2034,01C0,0800,0000,12D3   ;2485           Q_Q.AND.K[.8]                     ; MASK N BIT
U 12D3, 001D,A000,0180,0800,0010,12D4   ;2486           ALU_Q-D,CLK.UBCC,BYTE             ; CHECK RESULT
U 12D4, 0000,013C,0180,0800,0000,107C   ;2487           Z?
U 107C, 0001,203D,0180,09E8,0000,1218   ;2488   =0      ERROR2,RC[0D]_Q
                                        ;2489
                                        ;2490   ;+
                                        ;2491   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;2492   ;-
                                        ;2493
U 107D, 0000,003C,0180,0A10,0000,12D5   ;2494           LAB_R[2]
U 12D5, 0018,0014,1180,0A90,0000,12D6   ;2495           R[2]_LA+K[.4]                     ; INCREMENT ADR OF AMX DATA
U 12D6, 0000,003C,0180,0A20,0000,12D7   ;2496           LAB_R[4]
U 12D7, 0018,0014,0580,0AA0,0000,12D8   ;2497           R[4]_LA+K[.1]                     ; INCREMENT ADR OF EXPECTED DATA
U 12D8, 0810,0038,0180,0960,0000,12D9   ;2498           D_RC[0C]
U 12D9, 0019,8000,0580,09E0,0010,12DA   ;2499           RC[0C]_D-K[.1],CLK.UBCC,BYTE      ; DECREMENT THE LOOP COUNT
U 12DA, 0000,013C,0180,0800,0000,107E   ;2500           Z?
U 107E, 0000,003C,0180,0800,0000,1079   ;2501   =0      J/T147L3                          ; CONTINUE
U 107F, 0000,003C,0180,0800,0000,1080   ;2502           NOP
                                        ;2503
                                        ;2504
                                        ;2505   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2506   ;% 110
                                        ;2507   ; SUBTST 1
                                        ;2508   ;$ 5028,0000
                                        ;2509   ; SUBTST 2 AND 3
                                        ;2510   ;$ 6091,0050
                                        ;2511   ; SUBTST 4
                                        ;2512   ;$ 6070,0050
                                        ;2513   ;
                                        ;2514   ; THE FOLLOWING IS THE AMX DATA FOR THE ABOVE TEST:
                                        ;2515   ;% 120
                                        ;2516   ; SUBTST 2, LOOP COUNT 4 THRU 1
                                        ;2517   ;$ 0000,0000
                                        ;2518   ;$ 0040,0000
                                        ;2519   ;$ 0080,0000
                                        ;2520   ;$ 0000,0000
                                        ;2521   ; SUBTST 3, LOOP COUNT 2 THRU 1
                                        ;2522   ;$ 0080,0000
                                        ;2523   ;$ 0080,0000
                                        ;2524   ; SUBTST 4, LOOP COUNT 2 THRU 1
                                        ;2525   ;$ 8000,0000
                                        ;2526   ;$ 0080,8000
                                        ;2527   ;
                                        ;2528   ; THE FOLLOWING IS THE BMX DATA FOR THE ABOVE TEST:
                                        ;2529   ;% 140
                                        ;2530   ; SUBTST 2, LOOP COUNT 4 THRU 1
                                        ;2531   ;$ 0080,0000
                                        ;2532   ;$ 0040,0000
```

```
;2533   ;$ 0080,0000
;2534   ;$ 0000,0000
;2535   ; SUBTST 3, LOOP COUNT 2 THRU 1
;2536   ;$ 0080,0000
;2537   ;$ 0000,0000
;2538   ; SUBTST 4, LOOP COUNT 2 AND 1
;2539   ;$ 0000,0000
;2540   ;
;2541   ; THE FOLLOWING IS THE EXPECTED N BIT FOR THE ABOVE TEST:
;2542   ;% 160
;2543   ;$ 0008,0808,0000,0008
;2544
```

```
                                            .PAGE   "TEST 148       CM CONDITION CODE LOAD = 4"
                                            ;***********************************************************************
                                            ;++
                                            ; TEST  148     CM CONDITION CODE LOAD = 4
                                            ;
                                            ; TEST DESCRIPTION
                                            ;       THIS TEST CHECKS THAT EACH OF THE CONDITION CODES GETS LOADED
                                            ;       WITH THE CORRECT DATA WITH A UCCK FIELD OF 4.
                                            ;
                                            ;       SUBTST 1 - CHECK THAT THE Z BIT SETS AND THAT THE C, V, AND N BITS
                                            ;                  CLEAR WITH AMX AND ALU DATA EQUAL TO ZERO.
                                            ;       SUBTST 2 - CHECK THAT THE C AND N BIT SET AND THAT THE V AND Z BIT
                                            ;                  CLEAR WITH AMX AND ALU DATA OF "EF".
                                            ;
                                            ; LOGIC DESCRIPTION
                                            ;       THIS TEST CHECKS THAT N SELECT=1, Z SELECT=3, V SELECT=5, AND
                                            ;       C SELECT=4 SIGNALS ALONG WITH AMX BIT 00, ALU=0
                                            ;       AND THE INVERTED ALU SIGN ARE FED TO THE N, Z, V, AND C DATA SIGNALS
                                            ;       CORRECTLY.
                                            ;
                                            ; ERROR DESCRIPTION
                                            ;       DATA: EXPECTED CONDITION CODES
                                            ;             RECEIVED CONDITION CODES
                                            ;
                                            ; SYNC POINT DESCRIPTION
                                            ;       SUBTST 1 - SYNC04--CONDITION CODES ARE CLOCKED
                                            ;       SUBTST 2 - SYNC05--CONDITION CODES ARE CLOCKED
                                            ;--
                                            ;******************************************************************
                                            =0
U 1080, 0018,0039,0980,09F8,0000,11FC       T148:   NEWTST[.2]

                                            ;//////////////////////////////////////////////////////////////////////
                                            ;+
                                            ; CHECK THAT THE Z BIT SETS AND THAT N,V, AND C CLEAR
                                            ;-

U 1081, 0003,003C,0180,0A80,0000,1082       T148S1: R[0]_0                          ; INITIALIZE AMX DATA
U 1082, 0000,003D,0180,0800,0000,122F       =0      SUBTEST
U 1083, 0018,0038,1180,09F0,0000,1084               RC[OE]_K[.4]                    ; INIT EXPECTED VALUE OF CC'S
U 1084, 0000,003D,0180,0800,0000,1215       =0      ERLOOP
U 1085, 0818,0038,F580,0800,0000,12DB               D_K[.A]
U 12DB, 0819,0014,0580,0800,0000,12DC               D_D+K[.1]
U 12DC, 0000,003C,3D80,3C00,0000,1086               ID[PSL]_D                       ; INIT THE CC'S
U 1086, 0000,003D,0180,0800,0000,125B       =0      CALL,J/SETCM                    ; SET THE CM BIT
U 1087, 0810,0038,0180,0970,0000,12DD               D_RC[OE]                        ; GET EXPECTED CC'S
U 12DD, 0000,003C,0180,0A00,0040,12DE       SYNC04: A[U_R[0],SET.CC(ROR)            ; EXECUTE THE TEST
U 12DE, 0000,003C,3DF0,2C00,0000,12DF               Q_ID[PSL]                       ; READ THE CC'S
U 12DF, 0019,2034,61C0,0800,0000,12E0               Q_Q.AND.K[.F]                   ; MASK
U 12E0, 001D,A000,0180,0800,0010,12E1               A[U_Q-D,CLK.UBCC,BYTE           ; CHECK
U 12E1, 0000,013C,0180,0800,0000,1088               Z?
U 1088, 0001,203D,0180,09E8,0000,1216       =0      ERROR1,RC[OD]_Q                 ; CC'S FAILED

                                            ;//////////////////////////////////////////////////////////////////////
                                            ;+
                                     ;2600   ; CHECK THAT N AND C SET AND THAT Z AND V CLEAR
                                     ;2601   ;-
                                     ;2602
U 1089, 0018,0038,3D80,0A80,0000,108A  ;2603   T148S2: R[0]_K[.EF]                     ; INIT AMX DATA
U 108A, 0000,003D,0180,0800,0000,122F  ;2604   =0      SUBTEST
U 108B, 0018,0038,D980,09F0,0000,108C  ;2605           RC[0E]_K[.9]                    ; INIT EXPECTED CC'S
U 108C, 0000,003D,0180,0800,0000,1215  ;2606   =0      ERLOOP
U 108D, 0818,0038,D580,0800,0000,12E2  ;2607           D_K[.6]
U 12E2, 0000,003C,3D80,3C00,0000,108E  ;2608           ID[PSL]_D                       ; INIT THE CC'S
U 108E, 0000,003D,0180,0800,0000,125B  ;2609   =0      CALL,J/SETCM                    ; SET THE CM BIT
U 108F, 0810,0038,0180,0970,0000,12E3  ;2610           D_RC[0E]                        ; GET EXPECTED CC'S
U 12E3, 0000,803C,0180,0A00,0040,12E4  ;2611   SYNC05: A[U_R[0],SET.CC(ROR),BYTE       ; EXECUTE THE TEST
U 12E4, 0000,003C,3DF0,2C00,0000,12E5  ;2612           Q_ID[PSL]                       ; READ TEH CC'S
U 12E5, 0019,2034,61C0,0800,0000,12E6  ;2613           Q_Q.AND.K[.F]                   ; MASK
U 12E6, 001D,A000,0180,0800,0010,12E7  ;2614           A[U_Q-D,CLK.UBCC,BYTE           ; CHECK
U 12E7, 0000,013C,0180,0800,0000,1090  ;2615           Z?
U 1090, 0001,203D,0180,09E8,0000,1216  ;2616   =0      ERROR1,RC[0D]_Q                 ; CC'S FAILED
U 1091, 0000,003C,0180,0800,0000,1092  ;2617           NOP
                                     ;2618
                                     ;2619
```

```
                                          .PAGE  "TEST 149      CM CONDITION CODE LOAD = 5 (Z BIT)"
                                          ;**************************************************************************
                                          ;++
                                          ; TEST  149     CM CONDITION CODE LOAD = 5 (Z BIT)
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS TEST CHECKS THAT THE Z BIT IS SET OR CLEARED FROM THE ALU=0
                                          ;       DETECT FOR A UCCK FIELD EQUAL TO 5.
                                          ;
                                          ;       SUBTST 1 - CHECK THAT THE Z BIT CLEARS
                                          ;       SUBTST 2 - CHECK THAT THE Z BIT SETS
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;       THIS TEST CHECKS THE Z SELECT CODE = 3, FROM THE ZN PROM, AND PART OF
                                          ;       THE Z DATA MULTIPLEXOR ON THE CEH MODULE.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       DATA: EXPECTED CONDITION CODES
                                          ;             RECEIVED CONDITION CODES
                                          ;
                                          ; SYNC POINT DESCRIPTION
                                          ;       SUBTST 1 - SYNC06--Z BIT IS LOADED
                                          ;       SUBTST 2 - SYNC07--Z BIT IS LOADED
                                          ;--
                                          ;********************************************************************
                                          =0
U 1092, 0018,0039,0980,09F8,0000,11FC     T149:   NEWTST[.2]

                                          ;//////////////////////////////////////////////////////////////////////
                                          ;+
                                          ; CHECK THAT THE Z BIT SETS WHEN THE ALU=0
                                          ;-

U 1093, 0003,003C,0180,0A80,0000,1094     T149S1: R[0]_0                        ; INIT ALU DATA
U 1094, 0000,003D,0180,0800,0000,122F     =0      SUBTEST
U 1095, 0018,0038,1180,09F0,0000,1096             RC[0E]_K[.4]                  ; INIT THE EXPECTED DATA
U 1096, 0000,003D,0180,0800,0000,1215     =0      ERLOOP
U 1097, 0F00,003C,0180,0800,0000,12E8             D_0
U 12E8, 0000,003C,3D80,3C00,0000,1098             ID[PSL]_D                     ; INIT THE Z BIT
U 1098, 0000,003D,0180,0800,0000,125B     =0      CALL,J/SETCM                  ; SET THE CM BIT
U 1099, 0810,0038,0180,0970,0C00,12E9             D_RC[0E]                      ; GET THE EXPECTED DATA
U 12E9, 0000,003C,0180,0A00,0050,12EA     SYNC06: ALU_R[0],SET.N&Z              ; EXECUTE TEH TEST
U 12EA, 0000,003C,3DF0,2C00,0000,12EB             Q_ID[PSL]                     ; READ THE Z BIT
U 12EB, 0019,2034,11C0,0800,0000,12EC             Q_Q.AND.K[.4]                 ; MASK
U 12EC, 001D,A000,0180,0800,0010,12ED             ALU_Q-D,CLK.UBCC,BYTE         ; CHECK
U 12ED, 0000,013C,0180,0800,0000,109A             Z?
U 109A, 0001,203D,0180,09E8,0000,1216     =0      ERROR1,RC[0D]_Q               ; Z BIT FAILED

                                          ;//////////////////////////////////////////////////////////////////////
                                          ;+
                                          ; CHECK THAT THE Z BIT CLEARS WHEN THE ALU.NE.0
                                          ;-

U 109B, 0003,003C,0180,09F0,0000,109C     T149S2: RC[0E]_0
U 109C, 0000,003D,0180,0800,0000,122F     =0      SUBTEST
```

```
U 109D, 0018,0038,0580,0A80,0000,109E   ;2675           R[0]_K[.1]                        ; SET ALU DATA
U 109E, 0000,003D,0180,0800,0000,1215   ;2676   =0      ERLOOP
U 109F, 0818,0038,1180,0800,0000,12EE   ;2677           D_K[.4]
U 12EE, 0000,003C,3D80,3C00,0000,10A0   ;2678           ID[PSL]_D                         ; INIT THE Z BIT
U 10A0, 0000,003D,0180,0800,0000,125B   ;2679   =0      CALL,J/SETCM                      ; SET THE CM BIT
U 10A1, 0810,0038,0180,0970,0000,12EF   ;2680           D_RC[0E]                          ; GET THE EXPECTED DATA
U 12EF, 0000,803C,0180,0A00,0050,12F0   ;2681   SYNC07: A[U_R[0],SET.N&Z,BYTE             ; EXECUTE THE TEST
U 12F0, 0000,003C,3DF0,2C00,0000,12F1   ;2682           Q_ID[PSL]                         ; READ THE Z BIT
U 12F1, 0019,2034,11C0,0800,0000,12F2   ;2683           Q_Q.AND.K[.4]                     ; MASK
U 12F2, 001D,A000,0180,0800,0010,12F3   ;2684           A[U_Q-D,CLK.UBCC,BYTE             ; CHECK
U 12F3, 0000,013C,0180,0800,0000,10A2   ;2685           Z?
U 10A2, 0001,203D,0180,09E8,0000,1216   ;2686   =0      ERROR1,RC[0D]_Q                   ; Z BIT FAILED
U 10A3, 0000,003C,0180,0800,0000,10A4   ;2687           NOP
                                        ;2688
                                        ;2689
```

```
                                           .PAGE   "TEST 14A       CM CONDITION CODE LOAD = 6 (C, Z, AND N BITS)"
                                           ;******************************************************************************
                                           ;++
                                           ; TEST  14A     CM CONDITION CODE LOAD = 6 (C, Z, AND N BITS)
                                           ;
                                           ; TEST DESCRIPTION
                                           ;       THIS TEST CHECKS THAT THE C BIT IS LOADED FROM AMX00, THE Z BIT
                                           ;       IS LOADED FROM ITSELF, AND THE N BIT IS LOADED FROM ITSELF WHEN
                                           ;       THE UCCK FIELD = 6.
                                           ;
                                           ;       SUBTST 1 - CHECK THAT THE C, Z, AND N BITS CLEAR
                                           ;       SUBTST 2 - CHECK THAT THE C, Z, AND N BITS SET
                                           ;
                                           ; LOGIC DESCRIPTION
                                           ;       THIS TEST CHECKS C SELECT=4, Z SELECT=0, AND N SELECT=0 FROM
                                           ;       THE ZN AND CV PROMS, AND PART OF THE MULTIPLEXORS FOR THE C, Z, AND
                                           ;       N DATA SIGNALS ON THE CEH MODULE.
                                           ;
                                           ; ERROR DESCRIPTION
                                           ;       DATA: EXPECTED CONDITION CODES
                                           ;             RECEIVED CONDITION CODES
                                           ;
                                           ; SYNC POINT DESCRIPTION
                                           ;       SUBTST 1 - SYNC08--CONDITION CODES ARE LOADED
                                           ;       SUBTST 2 - SYNC09--CONDITION CODES ARE LOADED
                                           ;--
                                           ;****************************************************************************
                                           =0
U 10A4, 0018,0039,0980,09F8,0000,11FC      T14A:   NEWTST[.2]

                                           ;//////////////////////////////////////////////////////////////////////////////
                                           ;+
                                           ; CHECK THAT THE C, Z, AND N BITS CLEAR
                                           ;-

U 10A5, 0003,003C,0180,0A80,0000,10A6      T14AS1: R[0]_0                          ; INIT AMX DATA
U 10A6, 0000,003D,0180,0800,0000,122F      =0      SUBTEST
U 10A7, 0003,003C,0180,09F0,0000,10A8              RC[0E]_0                        ; INIT EXPECTED DATA
U 10A8, 0000,003D,0180,0800,0000,1215      =0      ERLOOP
U 10A9, 0818,0038,0580,0800,0000,12F4              D_K[.1]
U 12F4, 0000,003C,3D80,3C00,0000,10AA              ID[PSL]_D                       ; INIT THE CC'S
U 10AA, 0000,003D,0180,0800,0000,125B      =0      CALL,J/SETCM                    ; SET THE CM BIT
U 10AB, 0810,0038,0180,0970,0000,12F5              D_RC[0E]                        ; GET THE EXPECTED DATA
U 12F5, 0000,803C,0180,0A00,0060,12F6      SYNC08: A[U_R[0],SET.PSL.C(AMX),BYTE    ; EXECUTE THE TEST
U 12F6, 0000,003C,3DF0,2C00,0000,12F7              Q_ID[PSL]                       ; GET THE CC'S
U 12F7, 0019,2034,89C0,0800,0000,12F8              Q_Q.AND.K[.D]                   ; MASK
U 12F8, 001D,A000,0180,0800,0010,12F9              A[U_Q-D,CLK.UBCC,BYTE           ; CHECK
U 12F9, 0000,013C,0180,0800,0000,10AC              Z?
U 10AC, 0001,203D,0180,09E8,0000,1216      =0      ERROR1,RC[0D]_Q                 ; CC'S FAILED

                                           ;//////////////////////////////////////////////////////////////////////////////
                                           ;+
                                           ; CHECK THAT THE C, Z, AND N BITS SET
                                           ;-
```

```
U 10AD, 0018,0038,0580,0A80,0000,10AE    ;2745   T14AS2: R[0]_K[.1]                      ; SET THE AMX DATA
U 10AE, 0000,003D,0180,0800,0000,122F    ;2746   =0      SUBTEST
U 10AF, 0018,0038,8980,09F0,0000,10B0    ;2747           RC[OE]_K[.D]                    ; SET THE EXPECTED DATA
U 10B0, 0000,003D,0180,0800,0000,1215    ;2748   =0      ERLOOP
U 10B1, 0818,0038,8580,0800,0000,12FA    ;2749           D_K[.C]
U 12FA, 0000,003C,3D80,3C00,0000,10B2    ;2750           ID[PSL]_D                       ; INIT THE CC'S
U 10B2, 0000,003D,0180,0800,0000,125B    ;2751   =0      CALL,J/SETCM                    ; SET THE CM BIT
U 10B3, 0810,0038,0180,0970,0000,12FB    ;2752           D_RC[OE]                        ; GET THE EXPECTED VALUES
U 12FB, 0000,003C,0180,0A00,0060,12FC    ;2753   SYNC09: ALU_R[0],SET.PSL.C(AMX)         ; EXECUTE THE TEST
U 12FC, 0000,003C,3DF0,2C00,0000,12FD    ;2754           Q_ID[PSL]                       ; READ THE CC'S
U 12FD, 0019,2034,89C0,0800,0000,12FE    ;2755           Q_Q.AND.K[.D]                   ; MASK
U 12FE, 001D,A000,0180,0800,0010,12FF    ;2756           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 12FF, 0000,013C,0180,0800,0000,10B4    ;2757           Z?
U 10B4, 0001,203D,0180,09E8,0000,1216    ;2758   =0      ERROR1,RC[OD]_Q                 ; CC'S FAILED
U 10B5, 0000,003C,0180,0800,0000,10B6    ;2759           NOP
                                         ;2760
                                         ;2761
                                         .PAGE   "TEST 14B       CM CONDITION CODE LOAD = 6 (V BIT)"
                                         ;*********************************************************************
                                         ;++
                                         ; TEST  14B     CM CONDITION CODE LOAD = 6 (V BIT)
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS TEST CHECKS THAT THE V BIT SETS AND CLEARS PROPERLY
                                         ;       WHEN THE UCCK FIELD EQUALS 6. THE EQUATION FOR THE V DATA SIGNAL
                                         ;       IS:
                                         ;               -ALU SIGN*PSL C(1) + ALU SIGN*PSL C(0)
                                         ;
                                         ;       SUBTST 1 - CHECK THAT THE V BIT CLEARS DUE TO ALU SIGN FALSE AND
                                         ;                  PSL C IS CLEAR.
                                         ;       SUBTST 2 - CHECK THAT THE V BIT SETS DUE TO ALU SIGN FALSE AND
                                         ;                  PSL C SET.
                                         ;       SUBTST 3 - CHECK THAT THE V BIT SETS DUE TO ALU SIGN TRUE AND
                                         ;                  PSL C CLEAR.
                                         ;       SUBTST 4 - CHECK THAT THE V BIT CLEARS DUE TO ALU SIGN TRUE AND
                                         ;                  PSL C SET.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;       THIS TEST CHECKS THE V SELECT = 4 AND THE GATES THAT FEED THE V DATA
                                         ;       DATA SIGNAL FOR THIS CONDITION, ON THE CEH MODULE.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       DATA: EXPECTED CONDITION CODES
                                         ;             RECEIVED CONDITION CODES
                                         ;
                                         ; SYNC POINT DESCRIPTION
                                         ;       SUBTST 1 - SYNC0A--V BIT IS CLOCKED
                                         ;       SUBTST 2 - SYNC0B--V BIT IS CLOCKED
                                         ;       SUBTST 3 - SYNC0C--V BIT IS CLOCKED
                                         ;       SUBTST 4 - SYNC0D--V BIT IS CLOCKED
                                         ;--
                                         ;*********************************************************************
                                         =0
U 10B6, 0018,0039,0980,09F8,0000,11FC    T14B:   NEWTST[.2]

                                         ;///////////////////////////////////////////////////////////////////////
                                         ;+
                                         ; CHECK THAT V BIT CLEARS DUE TO -ALU SIGN*-PSL C
                                         ;-

U 10B7, 0003,003C,0180,0A80,0000,10B8    T14BS1: R[0]_0                         ; INIT THE ALU SIGN BIT
U 10B8, 0000,003D,0180,0800,0000,122F    =0      SUBTEST
U 10B9, 0003,003C,0180,09F0,0000,10BA            RC[OE]_0                       ; INIT THE EXPECTED DATA
U 10BA, 0000,003D,0180,0800,0000,1215    =0      ERLOOP
U 10BB, 0F00,003C,0180,0800,0000,1300            D_0
U 1300, 0000,003C,3D80,3C00,0000,10BC            ID[PSL]_D                      ; INIT THE V BIT
U 10BC, 0000,003D,0180,0800,0000,125B    =0      CALL,J/SETCM                   ; SET THE CM BIT
U 10BD, 0810,0038,0180,0970,0000,1301            D_RC[OE]                       ; GET TEH EXPECTED V BIT
U 1301, 0000,003C,0180,0A00,0060,1302    SYNC0A: ALU_R[0],SET.PSL.C(AMX)        ; EXECUTE THE TEST
U 1302, 0000,003C,3DF0,2C00,0000,1303            Q_ID[PSL]                      ; READ THE V BIT
U 1303, 0019,2034,09C0,0800,0000,1304            Q_Q.AND.K[.2]                  ; MASK
U 1304, 001D,A000,0180,0800,0010,1305            ALU_Q-D,CLK.UBCC,BYTE          ; CHECK
```

```
U 1305, 0000,013C,0180,0800,0000,10BE    ;2817               Z?
U 10BE, 0001,203D,0180,09E8,0000,1216    ;2818        =0      ERROR1,RC[OD]_Q                  ; V BIT FAILED
                                         ;2819
                                         ;2820        ;//////////////////////////////////////////////////////////////////////
                                         ;2821        ;+
                                         ;2822        ; CHECK THAT THE V BIT SETS DUE TO -ALU SIGN*PSL C
                                         ;2823        ;-
                                         ;2824
U 10BF, 0018,0038,0980,09F0,0000,10C0    ;2825        T14BS2: RC[OE]_K[.2]                     ; SET THE EXPECTED V BIT
U 10C0, 0000,003D,0180,0800,0000,122F    ;2826        =0      SUBTEST
U 10C1, 0000,003C,0180,0800,0000,10C2    ;2827                NOP
U 10C2, 0000,003D,0180,0800,0000,1215    ;2828        =0      ERLOOP
U 10C3, 0818,0038,0580,0800,0000,1306    ;2829                D_K[.1]
U 1306, 0000,003C,3D80,3C00,0000,10C4    ;2830                ID[PSL]_D                        ; INIT THE V BIT
U 10C4, 0000,003D,0180,0800,0000,125B    ;2831        =0      CALL,J/SETCM                     ; SET THE CM BIT
U 10C5, 0810,0038,0180,0970,0000,1307    ;2832                D_RC[OE]                         ; GET THE EXPECTED VALUE OF V BIT
U 1307, 0000,003C,0180,0A00,0060,1308    ;2833        SYNC0B: ALU_R[0],SET.PSL.C(AMX)          ; EXECUTE TEH TEST
U 1308, 0000,003C,3DF0,2C00,0000,1309    ;2834                Q_ID[PSL]                        ; READ THE CC'S
U 1309, 0019,2034,09C0,0800,0000,130A    ;2835                Q_Q.AND.K[.2]                    ; MASK THE V BIT
U 130A, 001D,A000,0180,0800,0010,130B    ;2836                ALU_Q-D,CLK.UBCC,BYTE            ; CHECK
U 130B, 0000,013C,0180,0800,0000,10C6    ;2837                Z?
U 10C6, 0001,203D,0180,09E8,0000,1216    ;2838        =0      ERROR1,RC[OD]_Q                  ; V BIT FAILED
                                         ;2839
                                         ;2840        ;//////////////////////////////////////////////////////////////////////
                                         ;2841        ;+
                                         ;2842        ; CHECK THAT THE V BIT SETS DUE TO ALU SIGN*-PSL C
                                         ;2843        ;-
                                         ;2844
U 10C7, 0018,0038,4180,0A80,0000,10C8    ;2845        T14BS3: R[0]_K[.80]                      ; INIT THE ALU DATA
U 10C8, 0000,003D,0180,0800,0000,122F    ;2846        =0      SUBTEST
U 10C9, 0018,0038,0980,09F0,0000,10CA    ;2847                RC[OE]_K[.2]                     ; INIT THE EXPECTED V BIT
U 10CA, 0000,003D,0180,0800,0000,1215    ;2848        =0      ERLOOP
U 10CB, 0F00,003C,0180,0800,0000,130C    ;2849                D_0
U 130C, 0000,003C,3D80,3C00,0000,10CC    ;2850                ID[PSL]_D                        ; INIT THE V BIT
U 10CC, 0000,003D,0180,0800,0000,125B    ;2851        =0      CALL,J/SETCM                     ; SET THE CM BIT
U 10CD, 0810,0038,0180,0970,0000,130D    ;2852                D_RC[OE]                         ; GET EXPECTED V BIT
U 130D, 0000,803C,0180,0A00,0060,130E    ;2853        SYNC0C: ALU_R[0],SET.PSL.C(AMX),BYTE     ; EXECUTE THE TEST
U 130E, 0000,003C,3DF0,2C00,0000,130F    ;2854                Q_ID[PSL]                        ; READ THE V BIT
U 130F, 0019,2034,09C0,0800,0000,1310    ;2855                Q_Q.AND.K[.2]                    ; MASK
U 1310, 001D,A000,0180,0800,0010,1311    ;2856                ALU_Q-D,CLK.UBCC,BYTE            ; CHECK
U 1311, 0000,013C,0180,0800,0000,10CE    ;2857                Z?
U 10CE, 0001,203D,0180,09E8,0000,1216    ;2858        =0      ERROR1,RC[OD]_Q                  ; V BIT FAILED
                                         ;2859
                                         ;2860        ;//////////////////////////////////////////////////////////////////////
                                         ;2861        ;+
                                         ;2862        ; CHECK THAT THE V BIT CLEARS DUE TO ALU SIGN*PSL C
                                         ;2863        ;-
                                         ;2864
U 10CF, 0003,003C,0180,09F0,0000,10D0    ;2865        T14BS4: RC[OE]_0                         ; INIT THE EXPECTED DATA
U 10D0, 0000,003D,0180,0800,0000,122F    ;2866        =0      SUBTEST
U 10D1, 0000,003C,0180,0800,0000,10D2    ;2867                NOP
U 10D2, 0000,003D,0180,0800,0000,1215    ;2868        =0      ERLOOP
U 10D3, 0818,0038,0D80,0800,0000,1312    ;2869                D_K[.3]
U 1312, 0000,003C,3D80,3C00,0000,10D4    ;2870                ID[PSL]_D                        ; INIT THE V BIT
U 10D4, 0000,003D,0180,0800,0000,125B    ;2871        =0      CALL,J/SETCM                     ; SET THE CM BIT
```

```
U 10D5, 0810,0038,0180,0970,0000,1313   ;2872             D_RC[OE]                         ; GET EXPECTED V BIT
U 1313, 0000,803C,0180,0A00,0060,1314   ;2873   SYNCOD:   A[U_R[O],SET.PSL.C(AMX),BYTE     ; EXECUTE THE TEST
U 1314, 0000,003C,3DF0,2C00,0000,1315   ;2874             Q_ID[PSL]                        ; READ THE V BIT
U 1315, 0019,2034,09C0,0800,0000,1316   ;2875             Q_Q.AND.K[.2]                    ; MASK
U 1316, 001D,A000,0180,0800,0010,1317   ;2876             A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 1317, 0000,013C,0180,0800,0000,10D6   ;2877             Z?
U 10D6, 0001,203D,0180,09E8,0000,1216   ;2878   =0        ERROR1,RC[OD]_Q                  ; V BIT FAILED
U 10D7, 00C0,003C,0180,0800,0000,10D8   ;2879             NOP
                                        ;2880
                                        ;2881
```

```
.PAGE   "TEST 14C       CM INSTRUCTION DEPENDENT COND CODE LOAD"
;**************************************************************************
;++
; TEST  14C     CM INSTRUCTION DEPENDENT COND CODE LOAD
;
; TEST DESCRIPTION
;       THIS TEST CHECKS THOSE FUNCTONS OF THE CONDITION CODES THAT WERE
;       NOT TESTED IN PREVIOUS TESTS AND REQUIRE A UCCK FIELD OF 7.
;       THE INSTRUCTION BUFFER IS LOADED WITH SPECIFIC OP CODES TO GENERATE
;       THE APPROPRIATE ADDRESSES ON THE CONDITION CODE PROMS, AND TO SELECT
;       THE APPROPRIATE DATA TYPE.
;
;       SUBTST 1 - CHECK C SELECT = 2 WITH ALU.NE.0
;       SUBTST 2 - CHECK C SELECT = 2 WITH ALU=0
;       SUBTST 3 - CHECK C SELECT = 6 WITH AMX SIGN=0
;       SUBTST 4 - CHECK C SELECT = 6 WITH AMX SIGN.NE.0
;       SUBTST 5 - CHECK VSELECT=1 WITH ALU SIGN*-AMX SIGN
;       SUBTST 6 - CHECK VSELECT=1 WITH ALU SIGN*AMX SIGN
;       SUBTST 7 - CHECK VSELECT=1 WITH -ALU SIGN*-AMX SIGN
;       SUBTST 8 - CHECK VSELECT=2 WITH PSL V SET
;       SUBTST 9 - CHECK VSELECT=2 WITH PSL V CLEAR
;       SUBTST A - CHECK VSELECT=4 WITH -ALU SIGN*PSL C
;       SUBTST B - CHECK VSELECT=5 WITH V DETECT SW TRUE
;       SUBTST C - CHECK Z SELECT = 4
;       SUBTST D - CHECK N SELECT = 1 WITH -ALU SIGN*INV ALU SIGN
;       SUBTST E - CHECK N SELECT = 1 WITH ALU SIGN*INV ALU SIGN
;       SUBTST F - CHECK C SELECT = 7
;
; LOGIC DESCRIPTION
;       THIS TEST CHECKS PART OF THE CM INSTRUCTION DEPENDENT PROM, PART OF
;       THE CV AND ZN PROMS, AND PART OF THE LOGIC THAT FEEDS THE C, V,
;       Z, AND N DATA SIGNALS ON THE CEH MODULE.
;
; ERROR DESCRIPTION
;       DATA: EXPECTED CONDITION CODES
;             RECEIVED CONDITION CODES
;
; SYNC POINT DESCRIPTION
;       SUBTST 1 - SYNC0E--CONDITION CODES ARE CLOCKED
;       SUBTST 2 - SYNC0F--CONDITION CODES ARE CLOCKED
;       SUBTST 3 - SYNC10--CONDITION CODES ARE CLOCKED
;       SUBTST 4 - SYNC11--CONDITION CODES ARE CLOCKED
;       SUBTST 5 - SYNC12--CONDITION CODES ARE CLOCKED
;       SUBTST 6 - SYNC13--CONDITION CODES ARE CLOCKED
;       SUBTST 7 - SYNC14--CONDITION CODES ARE CLOCKED
;       SUBTST 8 - SYNC15--CONDITION CODES ARE CLOCKED
;       SUBTST 9 - SYNC16--CONDITION CODES ARE CLOCKED
;       SUBTST A - SYNC17--CONDITION CODES ARE CLOCKED
;       SUBTST B - SYNC18--CONDITION CODES ARE CLOCKED
;       SUBTST C - SYNC19--CONDITION CODES ARE CLOCKED
;       SUBTST D - SYNC1A--CONDITION CODES ARE CLOCKED
;       SUBTST E - SYNC1B--CONDITION CODES ARE CLOCKED
;       SUBTST F - SYNC1C--CONDITION CODES ARE CLOCKED
;--
;**************************************************************************
```

```
                                          ;2937   =0
U 10D8, 0018,0039,0980,09F8,0000,11FC     ;2938   T14C:   NEWTST[.2]
U 10D9, 0003,003C,0180,0A88,0000,1318     ;2939           R[1]_0                          ; INIT ADR OF IB DATA
                                          ;2940
                                          ;2941   ;//////////////////////////////////////////////////////////////////////
                                          ;2942   ;+
                                          ;2943   ; C BIT CSEL<2:0>=HLH,  PSL C_ALU=0
                                          ;2944   ;-
                                          ;2945
U 1318, 0003,003C,0180,0A80,0000,10DA     ;2946   T14CS1: R[0]_0                          ; INIT THE ALU DATA
U 10DA, 0000,003D,0180,0800,0000,122F     ;2947   =0      SUBTEST
U 10DB, 0003,003C,0180,09F0,0000,10DC     ;2948           RC[OE]_0                        ; INIT EXPECTED CC'S
U 10DC, 0000,003D,0180,0800,0000,1215     ;2949   =0      ERLOOP
U 10DD, 0818,0038,0580,0800,0000,10DE     ;2950           D_K[.1]
U 10DE, 2000,003D,0180,0A08,4200,1235     ;2951   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10DF, 0000,003C,3DF0,2C00,0000,1319     ;2952           Q_ID[PSL]
U 1319, 0019,2024,61C0,0800,0000,131A     ;2953           Q_Q.ANDNOT.K[.F]
U 131A, 081D,0030,0180,0800,0000,131B     ;2954           D_D.OR.Q
U 131B, 0000,003C,3D80,3C00,0000,10E0     ;2955           ID[PSL]_D                       ; INIT THE C BIT
U 10E0, 0000,003D,0180,0800,0000,125B     ;2956   =0      CALL,J/SETCM                    ; SET THE CM BIT
U 10E1, 0810,0038,0180,0970,0000,131C     ;2957           D_RC[OE]                        ; GET EXPECTED C BIT
U 131C, 0000,C03C,0180,0A00,0070,131D     ;2958   SYNCOE: ALU_R[0],SET.CC(INST)           ; EXECUTE THE TEST
U 131D, 0000,003C,3DF0,2C00,0000,131E     ;2959           Q_ID[PSL]                       ; GET THE C BIT
U 131E, 0019,2034,05C0,0800,0000,131F     ;2960           Q_Q.AND.K[.1]                   ; MASK
U 131F, 001D,A000,0180,0800,0010,1320     ;2961           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 1320, 0000,013C,0180,0800,0000,10E2     ;2962           Z?
U 10E2, 0001,203D,0180,09E8,0000,1218     ;2963   =0      ERROR2,RC[OD]_Q                 ; C BIT FAILED
                                          ;2964
                                          ;2965   ;//////////////////////////////////////////////////////////////////////
                                          ;2966   ;+
                                          ;2967   ; CHECK THAT THE C BIT SETS
                                          ;2968   ;-
                                          ;2969
U 10E3, 0018,0038,C180,0A80,0000,10E4     ;2970   T14CS2: R[0]_K[.FFFF]                   ; INIT ALU DATA
U 10E4, 0000,003D,0180,0800,0000,122F     ;2971   =0      SUBTEST
U 10E5, 0018,0038,0580,09F0,0000,10E6     ;2972           RC[OE]_K[.1]                    ; INIT C EXPECTED
U 10E6, 0000,003D,0180,0800,0000,1215     ;2973   =0      ERLOOP
U 10E7, 0F00,003C,0180,0800,0000,10E8     ;2974           D_0
U 10E8, 2000,003D,0180,0A08,4200,1235     ;2975   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10E9, 0000,003C,3DF0,2C00,0000,1321     ;2976           Q_ID[PSL]
U 1321, 0019,2024,61C0,0800,0000,1322     ;2977           Q_Q.ANDNOT.K[.F]
U 1322, 081D,0030,0180,0800,0000,1323     ;2978           D_D.OR.Q
U 1323, 0000,003C,3D80,3C00,0000,10EA     ;2979           ID[PSL]_D                       ; INIT THE C BIT
U 10EA, 0000,003D,0180,0800,0000,125B     ;2980   =0      CALL,J/SETCM                    ; SET THE CM BIT
U 10EB, 0810,0038,0180,0970,0000,10EC     ;2981           D_RC[OE]                        ; GET THE EXPECTED VALUE
U 10EC, 0000,003D,0180,0800,0000,1234     ;2982   =0      CALL,J/DISPAT                   ; LATCH THE DATA TYPE
U 10ED, 0000,C03C,0180,0A00,0070,1324     ;2983   SYNCOF: ALU_R[0],SET.CC(INST)           ; EXECUTE TEH TEST
U 1324, 0000,003C,3DF0,2C00,0000,1325     ;2984           Q_ID[PSL]                       ; GET TEH C BIT
U 1325, 0019,2034,05C0,0800,0000,1326     ;2985           Q_Q.AND.K[.1]                   ; MASK
U 1326, 001D,A000,0180,0800,0010,1327     ;2986           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 1327, 0000,013C,0180,0800,0000,10EE     ;2987           Z?
U 10EE, 0001,203D,0180,09E8,0000,1218     ;2988   =0      ERROR2,RC[OD]_Q                 ; C BIT FAILED
                                          ;2989
                                          ;2990   ;//////////////////////////////////////////////////////////////////////
                                          ;2991   ;+
                                          ;2992   ; CSEL<2:0>=LLH,  PSL C_AMX SIGN L
                                          ;2993   ;-
                                          ;2994
U 10EF, 0000,003C,0180,0A08,0000,10F0     ;2995   T14CS3: LAB_R[1]
U 10F0, 0000,003D,0180,0800,0000,122F     ;2996   =0      SUBTEST
U 10F1, 0018,0014,0980,0A88,0000,1328     ;2997           R[1]_LA+K[.2]                    ; INCREMENT ADR OF IB DATA
U 1328, 0003,003C,0180,0A80,0000,1329     ;2998           R[0]_0                           ; INIT AMX DATA
U 1329, 0018,0038,0580,0980,0000,132A     ;2999           RC[0]_K[.1]                      ; INIT BMX DATA
U 132A, 0003,003C,0180,09F0,0000,10F2     ;3000           RC[OE]_0                         ; INIT EXPECTED C BIT
U 10F2, 0000,003D,0180,0800,0000,1215     ;3001   =0      ERLOOP
U 10F3, 0818,0038,0580,0800,0000,10F4     ;3002           D_K[.1]
U 10F4, 2000,003D,0180,0A08,4200,1235     ;3003   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10F5, 0000,003C,3DF0,2C00,0000,132B     ;3004           Q_ID[PSL]
U 132B, 0019,2024,61C0,0800,0000,132C     ;3005           Q_Q.ANDNOT.K[.F]
U 132C, 081D,0030,0180,0800,0000,132D     ;3006           D_D.OR.Q
U 132D, 0000,003C,3D80,3C00,0000,10F6     ;3007           ID[PSL]_D                        ; INIT THE C BIT
U 10F6, 0000,003D,0180,0800,0000,125B     ;3008   =0      CALL,J/SETCM                     ; SET THE CM BIT
U 10F7, 0810,0038,0180,0970,0000,10F8     ;3009           D_RC[OE]                         ; GET EXPECTED C BIT
U 10F8, 0000,003D,0180,0800,0000,1234     ;3010   =0      CALL,J/DISPAT                    ; LATCH THE DATA TYPE
U 10F9, 0000,003C,0180,0A00,0000,132E     ;3011           LAB_R[0]
U 132E, 0000,003C,0180,0900,0000,132F     ;3012           LC_RC[0]
U 132F, 0010,C014,0180,0800,0070,1330     ;3013   SYNC10: ALU_LA+LC,SET.CC(INST)           ; EXECUTE TEH TEST
U 1330, 0000,003C,3DF0,2C00,0000,1331     ;3014           Q_ID[PSL]                        ; GET THE C BIT
U 1331, 0019,2034,05C0,0800,0000,1332     ;3015           Q_Q.AND.K[.1]                    ; MASK
U 1332, 001D,A000,0180,0800,0010,1333     ;3016           A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 1333, 0000,013C,0180,0800,0000,10FA     ;3017           Z?
U 10FA, 0001,203D,0180,09E8,0000,1218     ;3018   =0      ERROR2,RC[OD]_Q                  ; C BIT FAILED
                                          ;3019
                                          ;3020   ;////////////////////////////////////////////////////////////////////
                                          ;3021   ;+
                                          ;3022   ; CHECK THAT THE C BIT SETS
                                          ;3023   ;-
                                          ;3024
U 10FB, 0018,0038,4580,0A80,0000,10FC     ;3025   T14CS4: R[0]_K[.8000]                    ; INIT THE AMX DATA
U 10FC, 0000,003D,0180,0800,0000,122F     ;3026   =0      SUBTEST
U 10FD, 0018,0038,0580,09F0,0000,10FE     ;3027           RC[OE]_K[.1]                     ; INIT THE EXPECTED DATA
U 10FE, 0000,003D,0180,0800,0000,1215     ;3028   =0      ERLOOP
U 10FF, 0F00,003C,0180,0800,0000,110A     ;3029           D_0
U 110A, 2000,003D,0180,0A08,4200,1235     ;3030   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 110B, 0000,003C,3DF0,2C00,0000,1334     ;3031           Q_ID[PSL]
U 1334, 0019,2024,61C0,0800,0000,1335     ;3032           Q_Q.ANDNOT.K[.F]
U 1335, 081D,0030,0180,0800,0000,1336     ;3033           D_D.OR.Q
U 1336, 0000,003C,3D80,3C00,0000,1110     ;3034           ID[PSL]_D                        ; INIT THE C BIT
U 1110, 0000,003D,0180,0800,0000,125B     ;3035   =0      CALL,J/SETCM                     ; SET THE CM BIT
U 1111, 0810,0038,0180,0970,0000,1112     ;3036           D_RC[OE]                         ; GET EXPECTED DATA
U 1112, 0000,003D,0180,0800,0000,1234     ;3037   =0      CALL,J/DISPAT                    ; LATCH THE DATA TYPE
U 1113, 0000,003C,0180,0A00,0000,1337     ;3038           LAB_R[0]
U 1337, 0000,003C,0180,0900,0000,1338     ;3039           LC_RC[0]
U 1338, 0010,C014,0180,0800,0070,1339     ;3040   SYNC11: ALU_LA+LC,SET.CC(INST)           ; EXECUTE THE TEST
U 1339, 0000,003C,3DF0,2C00,0000,133A     ;3041           Q_ID[PSL]                        ; GET THE C BIT
U 133A, 0019,2034,05C0,0800,0000,133B     ;3042           Q_Q.AND.K[.1]                    ; MASK
U 133B, 001D,A000,0180,0800,0010,133C     ;3043           A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 133C, 0000,013C,0180,0800,0000,1114     ;3044           Z?
U 1114, 0001,203D,0180,09E8,0000,1218     ;3045   =0      ERROR2,RC[OD]_Q                  ; C BIT FAILED
                                          ;3046
```

```
                                           ;3047  ;////////////////////////////////////////////////////////////////////////
                                           ;3048  ;+
                                           ;3049  ; NOW CHECK THE V BIT
                                           ;3050  ; VSEL=1, PSL V_ALU SIGN*-AMX SIGN
                                           ;3051  ;-
                                           ;3052
U 1115, 0018,0038,0980,09F0,0000,1116     ;3053  T14CS5: RC[OE]_K[.2]                         ; SET EXPECTED V BIT
U 1116, 0000,003D,0180,0800,0000,122F     ;3054  =0      SUBTEST
U 1117, 0003,003C,0180,0A80,0000,133D     ;3055          R[0]_0                               ; INIT AMX DATA
U 133D, 0018,0038,C180,0980,0000,1118     ;3056          RC[0]_K[.FFFF]                       ; INIT BMX DATA
U 1118, 0000,003D,0180,0800,0000,1215     ;3057  =0      ERLOOP
U 1119, 0F00,003C,0180,0800,0000,111A     ;3058          D_0
U 111A, 2000,003D,0180,0A08,4200,1235     ;3059  =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD TEH IB
U 111B, 0000,003C,3DF0,2C00,0000,133E     ;3060          Q_ID[PSL]
U 133E, 0019,2024,61C0,0800,0000,133F     ;3061          Q_Q.ANDNOT.K[.F]
U 133F, 081D,0030,0180,0800,0000,1340     ;3062          D_D.OR.Q
U 1340, 0000,003C,3D80,3C00,0000,111C     ;3063          ID[PSL]_D                            ; INIT THE C BIT
U 111C, 0000,003D,0180,0800,0000,125B     ;3064  =0      CALL,J/SETCM                         ; SET THE CM BIT
U 111D, 0810,0038,0180,0970,0000,111E     ;3065          D_RC[OE]                             ; GET EXPECTED DATA
U 111E, 0000,003D,0180,0800,0000,1234     ;3066  =0      CALL,J/DISPAT                        ; LATCH THE DATA TYPE
U 111F, 0000,003C,0180,0A00,0000,1341     ;3067          LAB_R[0]
U 1341, 0000,003C,0180,0900,0000,1342     ;3068          LC_RC[0]
U 1342, 0010,C014,0180,0800,0070,1343     ;3069  SYNC12: ALU_LA+LC,SET.CC(INST)              ; EXECUTE THE TEST
U 1343, 0000,003C,3DF0,2C00,0000,1344     ;3070          Q_ID[PSL]                            ; GET THE V BIT
U 1344, 0019,2034,09C0,0800,0000,1345     ;3071          Q_Q.AND.K[.2]                        ; MASK
U 1345, 001D,A000,0180,0800,0010,1346     ;3072          ALU_Q-D,CLK.UBCC,BYTE                ; CHECK
U 1346, 0000,013C,0180,0800,0000,1120     ;3073          Z?
U 1120, 0001,203D,0180,09E8,0000,1218     ;3074  =0      ERROR2,RC[OD]_Q                      ; V BIT FAILED
                                           ;3075
                                           ;3076  ;////////////////////////////////////////////////////////////////////////
                                           ;3077  ;+
                                           ;3078  ; CHECK THAT THE V BIT CLEARS
                                           ;3079  ;-
                                           ;3080
U 1121, 0018,0038,C180,0A80,0000,1122     ;3081  T14CS6: R[0]_K[.FFFF]                        ; INIT AMX DATA
U 1122, 0000,003D,0180,0800,0000,122F     ;3082  =0      SUBTEST
U 1123, 0003,003C,0180,0980,0000,1347     ;3083          RC[0]_0                              ; INIT BMX DATA
U 1347, 0003,003C,0180,09F0,0000,1124     ;3084          RC[OE]_0                             ; INIT EXPECTED V BIT
U 1124, 0000,003D,0180,0800,0000,1215     ;3085  =0      ERLOOP
U 1125, 0818,0038,0980,0800,0000,1126     ;3086          D_K[.2]
U 1126, 2000,003D,0180,0A08,4200,1235     ;3087  =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1127, 0000,003C,3DF0,2C00,0000,1348     ;3088          Q_ID[PSL]
U 1348, 0019,2024,61C0,0800,0000,1349     ;3089          Q_Q.ANDNOT.K[.F]
U 1349, 081D,0030,0180,0800,0000,134A     ;3090          D_D.OR.Q
U 134A, 0000,003C,3D80,3C00,0000,1128     ;3091          ID[PSL]_D                            ; INIT THE C BIT
U 1128, 0000,003D,0180,0800,0000,125B     ;3092  =0      CALL,J/SETCM                         ; SET THE CM BIT
U 1129, 0810,0038,0180,0970,0000,112A     ;3093          D_RC[OE]                             ; GET THE EXPECTED DATA
U 112A, 0000,003D,0180,0800,0000,1234     ;3094  =0      CALL,J/DISPAT                        ; LATCH THE DATA TYPE
U 112B, 0000,003C,0180,0A00,0000,134B     ;3095          LAB_R[0]
U 134B, 0000,003C,0180,0900,0000,134C     ;3096          LC_RC[0]
U 134C, 0010,C014,0180,0800,0070,134D     ;3097  SYNC13: ALU_LA+LC,SET.CC(INST)              ; EXECUTE THE TEST
U 134D, 0000,003C,3DF0,2C00,0000,134E     ;3098          Q_ID[PSL]                            ; GET THE V BIT
U 134E, 0019,2034,09C0,0800,0000,134F     ;3099          Q_Q.AND.K[.2]                        ; MASK
U 134F, 001D,A000,0180,0800,0010,1350     ;3100          ALU_Q-D,CLK.UBCC,BYTE                ; CHECK
U 1350, 0000,013C,0180,0800,0000,112C     ;3101          Z?
```

```
U 112C, 0001,203D,0180,09E8,0000,1218   ;3102   =0      ERROR2,RC[0D]_Q                 ; V BIT FAILED
                                        ;3103
                                        ;3104   ;////////////////////////////////////////////////////////////////////
                                        ;3105   ;+
                                        ;3106   ; CHECK THAT THE V BIT CLEARS
                                        ;3107   ;-
                                        ;3108
U 112D, 0003,003C,0180,0A80,0000,112E   ;3109   T14CS7: R[0]_0                          ; INIT AMX DATA
U 112E, 0000,003D,0180,0800,0000,122F   ;3110   =0      SUBTEST
U 112F, 0000,003C,0180,0800,0000,1130   ;3111           NOP
U 1130, 0000,003D,0180,0800,0000,1215   ;3112   =0      ERLOOP
U 1131, 0818,0038,0580,0800,0000,1132   ;3113           D_K[.1]
U 1132, 2000,003D,0180,0A08,4200,1235   ;3114   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1133, 0000,003C,3DF0,2C00,0000,1351   ;3115           Q_IB[PSL]
U 1351, 0019,2024,61C0,0800,0000,1352   ;3116           Q_Q.ANDNOT.K[.F]
U 1352, 081D,0030,0180,0800,0000,1353   ;3117           D_D.OR.Q
U 1353, 0000,003C,3D80,3C00,0000,1134   ;3118           IB[PSL]_D                       ; INIT THE C BIT
U 1134, 0000,003D,0180,0800,0000,125B   ;3119   =0      CALL,J/SETCM                    ; SET THE CM BIT
U 1135, 0810,0038,0180,0970,0000,1136   ;3120           D_RC[0E]                        ; GET EXPECTED VALUE
U 1136, 0000,003D,0180,0800,0000,1234   ;3121   =0      CALL,J/DISPAT                   ; LATCH THE DATA TYPE
U 1137, 0000,003C,0180,0A00,0000,1354   ;3122           LAB_R[0]
U 1354, 0000,003C,0180,0900,0000,1355   ;3123           LC_RC[0]
U 1355, 0010,C014,0180,0800,0070,1356   ;3124   SYNC14: ALU_LA+LC,SET.CC(INST)          ; EXECUTE THE TEST
U 1356, 0000,003C,3DF0,2C00,0000,1357   ;3125           Q_IB[PSL]                       ; GET THE V BIT
U 1357, 0019,2034,09C0,0800,0000,1358   ;3126           Q_Q.AND.K[.2]                   ; MASK
U 1358, 001D,A000,0180,0800,0010,1359   ;3127           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 1359, 0000,013C,0180,0800,0000,1138   ;3128           Z?
U 1138, 0001,203D,0180,09E8,0000,1218   ;3129   =0      ERROR2,RC[0D]_Q                 ; V BIT FAILED
                                        ;3130
                                        ;3131   ;////////////////////////////////////////////////////////////////////
                                        ;3132   ;+
                                        ;3133   ; VSEL=2,  PSL V_PSL V(1)
                                        ;3134   ;-
                                        ;3135
U 1139, 0003,003C,0180,0A80,0000,113A   ;3136   T14CS8: R[0]_0                          ; INIT AMX DATA
U 113A, 0000,003D,0180,0800,0000,122F   ;3137   =0      SUBTEST
U 113B, 0003,003C,0180,0980,0000,135A   ;3138           RC[0]_0                         ; INIT BMX DATA
U 135A, 0000,003C,0180,0A08,0000,135B   ;3139           LAB_R[1]
U 135B, 0018,0014,0980,0A88,0000,135C   ;3140           R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 135C, 0018,0038,0980,09F0,0000,113C   ;3141           RC[0E]_K[.2]                    ; INIT EXPECTED V BIT
U 113C, 0000,003D,0180,0800,0000,1215   ;3142   =0      ERLOOP
U 113D, 0818,0038,0980,0800,0000,113E   ;3143           D_K[.2]
U 113E, 2000,003D,0180,0A08,4200,1235   ;3144   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 113F, 0000,003C,3DF0,2C00,0000,135D   ;3145           Q_IB[PSL]
U 135D, 0019,2024,61C0,0800,0000,135E   ;3146           Q_Q.ANDNOT.K[.F]
U 135E, 081D,0030,0180,0800,0000,135F   ;3147           D_D.OR.Q
U 135F, 0000,003C,3D80,3C00,0000,1140   ;3148           IB[PSL]_D                       ; INIT THE C BIT
U 1140, 0000,003D,0180,0800,0000,125B   ;3149   =0      CALL,J/SETCM                    ; SET THE CM BIT
U 1141, 0810,0038,0180,0970,0000,1142   ;3150           D_RC[0E]                        ; GET THE EXPECTED VALUE
U 1142, 0000,003D,0180,0800,0000,1234   ;3151   =0      CALL,J/DISPAT                   ; LATCH THE DT
U 1143, 0000,003C,0180,0A00,0000,1360   ;3152           LAB_R[0]
U 1360, 0000,003C,0180,0900,0000,1361   ;3153           LC_RC[0]
U 1361, 0010,C014,0180,0800,0070,1362   ;3154   SYNC15: ALU_LA+LC,SET.CC(INST)          ; EXECUTE THE TEST
U 1362, 0000,003C,3DF0,2C00,0000,1363   ;3155           Q_IB[PSL]
U 1363, 0019,2034,09C0,0800,0000,1364   ;3156           Q_Q.AND.K[.2]                   ; MASK THE V BIT
```

```
U 1364, 001D,A000,0180,0800,0010,1365    ;3157           ALU_Q-D,CLK.UBCC,BYTE            ; CHECK
U 1365, 0000,013C,0180,0800,0000,1144    ;3158           Z?
U 1144, 0001,203D,0180,09E8,0000,1218    ;3159   =0      ERROR2,RC[OD]_Q                  ; V BIT FAILED
                                         ;3160
                                         ;3161   ;//////////////////////////////////////////////////////////////////////
                                         ;3162   ;+
                                         ;3163   ; CHECK THAT THE V BIT SETS
                                         ;3164   ;-
                                         ;3165
U 1145, 0018,0038,C180,0980,0000,1146    ;3166   T14CS9: RC[0]_K[.FFFF]                   ; SET BMX DATA
U 1146, 0000,003D,0180,0800,0000,122F    ;3167   =0      SUBTEST
U 1147, 0000,003C,0180,0800,0000,1148    ;3168           NOP
U 1148, 0000,003D,0180,0800,0000,1215    ;3169   =0      ERLOOP
U 1149, 0818,0038,0980,0800,0000,114A    ;3170           D_K[.2]
U 114A, 2000,003D,0180,0A08,4200,1235    ;3171   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 114B, 0000,003C,3DF0,2C00,0000,1366    ;3172           Q_ID[PSL]
U 1366, 0019,2024,61C0,0800,0000,1367    ;3173           Q_Q.ANDNOT.K[.F]
U 1367, 081D,0030,0180,0800,0000,1368    ;3174           D_D.OR.Q
U 1368, 0000,003C,3D80,3C00,0000,114C    ;3175           ID[PSL]_D                        ; INIT THE C BIT
U 114C, 0000,003D,0180,0800,0000,125B    ;3176   =0      CALL,J/SETCM                     ; SET THE CM BIT
U 114D, 0810,0038,0180,0970,0000,114E    ;3177           D_RC[OE]                         ; GET EXPECTED DATA
U 114E, 0000,003D,0180,0800,0000,1234    ;3178   =0      CALL,J/DISPAT                    ; LATCH THE DATA TYPE
U 114F, 0000,003C,0180,0A00,0000,1369    ;3179           LAB_R[0]
U 1369, 0000,003C,0180,0900,0000,136A    ;3180           LC_RC[0]
U 136A, 0010,C014,0180,0800,0070,136B    ;3181   SYNC16: ALU_LA+LC,SET.CC(INST)           ; EXECUTE THE TEST
U 136B, 0000,003C,3DF0,2C00,0000,136C    ;3182           Q_ID[PSL]
U 136C, 0019,2034,09C0,0800,0000,136D    ;3183           Q_Q.AND.K[.2]                    ; MASK
U 136D, 001D,A000,0180,0800,0010,136E    ;3184           ALU_Q-D,CLK.UBCC,BYTE            ; CHECK
U 136E, 0000,013C,0180,0800,0000,1150    ;3185           Z?
U 1150, 0001,203D,0180,09E8,0000,1218    ;3186   =0      ERROR2,RC[OD]_Q                  ; V BIT FAILED
                                         ;3187
                                         ;3188   ;//////////////////////////////////////////////////////////////////////
                                         ;3189   ;+
                                         ;3190   ; VSEL=4, PSL V_-ALU SIGN*PSL C(1)
                                         ;3191   ;-
                                         ;3192
U 1151, 0000,003C,0180,0A08,0000,1152    ;3193   T14CSA: LAB_R[1]
U 1152, 0000,003D,0180,0800,0000,122F    ;3194   =0      SUBTEST
U 1153, 0018,0014,0980,0A88,0000,136F    ;3195           R[1]_LA+K[.2]                    ; INCREMENT ADR OF IB DATA
U 136F, 0018,0038,0980,09F0,0000,1370    ;3196           RC[OE]_K[.2]                     ; SET EXPECTED DATA
U 1370, 0003,003C,0180,0A80,0000,1154    ;3197           R[0]_0                           ; SET AMX DATA
U 1154, 0000,003D,0180,0800,0000,1215    ;3198   =0      ERLOOP
U 1155, 0818,0038,0580,0800,0000,1156    ;3199           D_K[.1]
U 1156, 2000,003D,0180,0A08,4200,1235    ;3200   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1157, 0000,003C,3DF0,2C00,0000,1371    ;3201           Q_ID[PSL]
U 1371, 0019,2024,61C0,0800,0000,1372    ;3202           Q_Q.ANDNOT.K[.F]
U 1372, 081D,0030,0180,0800,0000,1373    ;3203           D_D.OR.Q
U 1373, 0000,003C,3D80,3C00,0000,1158    ;3204           ID[PSL]_D                        ; INIT THE C BIT
U 1158, 0000,003D,0180,0800,0000,125B    ;3205   =0      CALL,J/SETCM                     ; SET THE CM BIT
U 1159, 0810,0038,0180,0970,0000,115A    ;3206           D_RC[OE]                         ; GET EXPECTED VALUE
U 115A, 0000,003D,0180,0800,0000,1234    ;3207   =0      CALL,J/DISPAT                    ; LATCH THE DT
U 115B, 0000,C03C,0180,0A00,0070,1374    ;3208   SYNC17: ALU_R[0],SET.CC(INST)            ; EXECUTE THE TEST
U 1374, 0000,003C,3DF0,2C00,0000,1375    ;3209           Q_ID[PSL]
U 1375, 0019,2034,09C0,0800,0000,1376    ;3210           Q_Q.AND.K[.2]                    ; MASK THE V BIT
U 1376, 001D,A000,0180,0800,0010,1377    ;3211           ALU_Q-D,CLK.UBCC,BYTE            ; CHECK
```

```
U 1377, 0000,013C,0180,0800,0000,115C    ;3212                   Z?
U 115C, 0001,203D,0180,09E8,0000,1218    ;3213         =0        ERROR2,RC[OD]_Q                  ; V BIT FAILED
                                         ;3214
                                         ;3215         ;///////////////////////////////////////////////////////////////////////
                                         ;3216         ;+
                                         ;3217         ; VSEL=5, PSL V_V DETECT SW
                                         ;3218         ;-
                                         ;3219
U 115D, 0000,003C,0180,0A08,0000,115E    ;3220         T14CSB: LAB_R[1]
U 115E, 0000,003D,0180,0800,0000,122F    ;3221         =0        SUBTEST
U 115F, 0018,0014,0980,0A88,0000,1378    ;3222                   R[1]_LA+K[.2]                    ; INCREMENT ADR OF IB DATA
U 1378, 0018,0038,0980,09F0,0000,1160    ;3223                   RC[OE]_K[.2]                     ; SET EXPECTED VALUE
U 1160, 0000,003D,0180,0800,0000,1215    ;3224         =0        ERLOOP
U 1161, 0F00,003C,0180,0800,0000,1162    ;3225                   D_0
U 1162, 2000,003D,0180,0AC8,4200,1235    ;3226         =0        A[U_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE IB
U 1163, 0000,003C,3DF0,2C00,0000,1379    ;3227                   Q_ID[PSL]
U 1379, 0019,2024,61C0,0800,0000,137A    ;3228                   Q_Q.ANDNOT.K[.F]
U 137A, 081D,0030,0180,0800,0000,137B    ;3229                   D_D.OR.Q
U 137B, 0000,003C,3D80,3C00,0000,1164    ;3230                   ID[PSL]_D                        ; INIT THE C BIT
U 1164, 0000,003D,0180,0800,0000,125B    ;3231         =0        CALL,J/SETCM                     ; SET THE CM BIT
U 1165, 0000,C03C,0180,0800,0070,137C    ;3232         SYNC18: SET.CC(INST)                       ; EXECUTE THE TEST
U 137C, 0810,0038,0180,0970,0000,137D    ;3233                   D_RC[OE]
U 137D, 0000,003C,3DF0,2C00,0000,137E    ;3234                   Q_ID[PSL]
U 137E, 0019,2034,09C0,0800,0000,137F    ;3235                   Q_Q.AND.K[.2]                    ; MASK THE V BIT
U 137F, 001D,A000,0180,0800,0010,1380    ;3236                   A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 1380, 0000,013C,0180,0800,0000,1166    ;3237                   Z?
U 1166, 0001,203D,0180,09E8,0000,1218    ;3238         =0        ERROR2,RC[OD]_Q                  ; V BIT FAILED
                                         ;3239
                                         ;3240         ;///////////////////////////////////////////////////////////////////////
                                         ;3241         ;+
                                         ;3242         ; NOW CHECK THE Z BIT
                                         ;3243         ; ZSEL<2:0>=LHH,  PSL Z_0
                                         ;3244         ;-
                                         ;3245
U 1167, 0000,003C,0180,0A08,0000,1168    ;3246         T14CSC: LAB_R[1]
U 1168, 0000,003D,0180,0800,0000,122F    ;3247         =0        SUBTEST
U 1169, 0018,0014,0980,0A88,0000,1381    ;3248                   R[1]_LA+K[.2]                    ; INCREMENT ADR OF IB DATA
U 1381, 0003,003C,0180,09F0,0000,116A    ;3249                   RC[OE]_0                         ; SET EXPECTED Z BIT
U 116A, 0000,003D,0180,0800,0000,1215    ;3250         =0        ERLOOP
U 116B, 0818,0038,1180,0800,0000,116C    ;3251                   D_K[.4]
U 116C, 2000,003D,0180,0A08,4200,1235    ;3252         =0        A[U_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE IB
U 116D, 0000,003C,3DF0,2C00,0000,1382    ;3253                   Q_ID[PSL]
U 1382, 0019,2024,61C0,0800,0000,1383    ;3254                   Q_Q.ANDNOT.K[.F]
U 1383, 081D,0030,0180,0800,0000,1384    ;3255                   D_D.OR.Q
U 1384, 0000,003C,3D80,3C00,0000,116E    ;3256                   ID[PSL]_D                        ; INIT THE C BIT
U 116E, 0000,003D,0180,0800,0000,125B    ;3257         =0        CALL,J/SETCM                     ; SET THE CM BIT
U 116F, 0000,C03C,0180,0800,0070,1385    ;3258         SYNC19: SET.CC(INST)                       ; EXECUTE THE TEST
U 1385, 0810,0038,0180,0970,0000,1386    ;3259                   D_RC[OE]
U 1386, 0000,003C,3DF0,2C00,0000,1387    ;3260                   Q_ID[PSL]
U 1387, 0019,2034,11C0,0800,0000,1388    ;3261                   Q_Q.AND.K[.4]                    ; MASK THE Z BIT
U 1388, 001D,A000,0180,0800,0010,1389    ;3262                   A[U_Q-D,CLK.UBCC,BYTE            ; CHECK
U 1389, 0000,013C,0180,0800,0000,1170    ;3263                   Z?
U 1170, 0001,203D,0180,09E8,0000,1218    ;3264         =0        ERROR2,RC[OD]_Q                  ; Z BIT FAILED
                                         ;3265
                                         ;3266         ;///////////////////////////////////////////////////////////////////////
```

```
                                        ;3267    ;+
                                        ;3268    ; NOW CHECK THE N BIT
                                        ;3269    ; NSEL<2:0>=HHL,  PSL N_-ALU SIGN*INV ALU SIGN (INV ALU SIGN IS HIGH)
                                        ;3270    ;-
                                        ;3271
U 1171, 0018,0038,0180,09F0,0000,1172   ;3272    T14CSD: RC[0E]_K[.8]                    ; SET EXPECTED N BIT
U 1172, 0000,003D,0180,0800,0000,122F   ;3273    =0      SUBTEST
U 1173, 0003,003C,0180,0A80,0000,1174   ;3274            R[0]_0                          ; SET ALU DATA
U 1174, 0000,003D,0180,0800,0000,1215   ;3275    =0      ERLOOP
U 1175, 0818,0038,0180,0800,0000,1176   ;3276            D_K[.8]
U 1176, 2000,003D,0180,0A08,4200,1235   ;3277    =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1177, 0000,003C,3DF0,2C00,0000,138A   ;3278            Q_ID[PSL]
U 138A, 0019,2024,61C0,0800,0000,138B   ;3279            Q_Q.ANDNOT.K[.F]
U 138B, 081D,0030,0180,0800,0000,138C   ;3280            D_D.OR.Q
U 138C, 0000,003C,3D80,3C00,0000,1178   ;3281            ID[PSL]_D                       ; INIT THE C BIT
U 1178, 0000,003D,0180,0800,0000,125B   ;3282    =0      CALL,J/SETCM                    ; SET THE CM BIT
U 1179, 0810,0038,0180,0970,0000,117A   ;3283            D_RC[0E]                        ; GET EXPECTED N BIT
U 117A, 0000,003D,0180,0800,0000,1234   ;3284    =0      CALL,J/DISPAT                   ; LATCH THE DATA TYPE
U 117B, 0000,C03C,0180,0A00,0070,138D   ;3285    SYNC1A: ALU_R[0],SET.CC(INST)           ; EXECUTE THE TEST
U 138D, 0000,003C,3DF0,2C00,0000,138E   ;3286            Q_ID[PSL]
U 138E, 0019,2034,01C0,0800,0000,138F   ;3287            Q_Q.AND.K[.8]                   ; MASK THE N BIT
U 138F, 001D,A000,0180,0800,0010,1390   ;3288            ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 1390, 0000,013C,0180,0800,0000,117C   ;3289            Z?
U 117C, 0001,203D,0180,09E8,0000,1218   ;3290    =0      ERROR2,RC[0D]_Q                 ; N BIT FAILED
                                        ;3291
                                        ;3292    ;//////////////////////////////////////////////////////////////////////
                                        ;3293    ;+
                                        ;3294    ; CHECK THAT THE N BIT CLEARS
                                        ;3295    ;-
                                        ;3296
U 117D, 0003,003C,0180,09F0,0000,117E   ;3297    T14CSE: RC[0E]_0                        ; SET THE EXPECTED DATA
U 117E, 0000,003D,0180,0800,0000,122F   ;3298    =0      SUBTEST
U 117F, 0018,0038,4580,0A80,0000,1180   ;3299            R[0]_K[.8000]                   ; SET THE ALU DATA
U 1180, 0000,003D,0180,0800,0000,1215   ;3300    =0      ERLOOP
U 1181, 0F00,003C,0180,0800,0000,1182   ;3301            D_0
U 1182, 2000,003D,0180,0A08,4200,1235   ;3302    =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1183, 0000,003C,3DF0,2C00,0000,1391   ;3303            Q_ID[PSL]
U 1391, 0019,2024,61C0,0800,0000,1392   ;3304            Q_Q.ANDNOT.K[.F]
U 1392, 081D,0030,0180,0800,0000,1393   ;3305            D_D.OR.Q
U 1393, 0000,003C,3D80,3C00,0000,1184   ;3306            ID[PSL]_D                       ; INIT THE C BIT
U 1184, 0000,003D,0180,0800,0000,125B   ;3307    =0      CALL,J/SETCM                    ; SET THE CM BIT
U 1185, 0810,0038,0180,0970,0000,1186   ;3308            D_RC[0E]                        ; GET EXPECTED DATA
U 1186, 0000,003D,0180,0800,0000,1234   ;3309    =0      CALL,J/DISPAT                   ; LATCH THE DATA TYPE
U 1187, 0000,C03C,0180,0A00,0070,1394   ;3310    SYNC1B: ALU_R[0],SET.CC(INST)           ; EXECUTE THE TEST
U 1394, 0000,003C,3DF0,2C00,0000,1395   ;3311            Q_ID[PSL]
U 1395, 0019,2034,01C0,0800,0000,1396   ;3312            Q_Q.AND.K[.8]                   ; MASK THE N BIT
U 1396, 001D,A000,0180,0800,0010,1397   ;3313            ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 1397, 0000,013C,0180,0800,0000,1188   ;3314            Z?
U 1188, 0001,203D,0180,09E8,0000,1218   ;3315    =0      ERROR2,RC[0D]_Q                 ; N BIT FAILED
                                        ;3316
                                        ;3317    ;//////////////////////////////////////////////////////////////////////
                                        ;3318    ;+
                                        ;3319    ; CSEL<2:0>=LLL,  PSL C_1
                                        ;3320    ;-
                                        ;3321
```

```
U 1189, 0000,003C,0180,0A08,0000,118A   T14CSF: LAB_R[1]
U 118A, 0000,003D,0180,0800,0000,122F   =0      SUBTEST
U 118B, 0018,0014,0980,0A88,0000,1398           R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 1398, 0018,0038,0580,09F0,0000,118C           RC[0E]_K[.1]                    ; SET EXPECTED C BIT
U 118C, 0000,003D,0180,0800,0000,1215   =0      ERLOOP
U 118D, 0F00,003C,0180,0800,0000,118E           D_0
U 118E, 2000,003D,0180,0A08,4200,1235   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 118F, 0000,003C,3DF0,2C00,0000,1399           Q_ID[PSL]
U 1399, 0019,2024,61C0,0800,0000,139A           Q_Q.ANDNOT.K[.F]
U 139A, 081D,0030,0180,0800,0000,139B           D_D.OR.Q
U 139B, 0000,003C,3D80,3C00,0000,1190           ID[PSL]_D                       ; INIT THE C BIT
U 1190, 0000,003D,0180,0800,0000,125B   =0      CALL,J/SETCM                    ; SET THE CM BIT
U 1191, 0810,C038,0180,0970,0070,139C   SYNC1C: D_RC[0E],SET.CC(INST)           ; EXECUTE THE TEST
U 139C, 0000,003C,3DF0,2C00,0000,139D           Q_ID[PSL]
U 139D, 0019,2034,05C0,0800,0000,139E           Q_Q.AND.K[.1]                   ; MASK THE C BIT
U 139E, 001D,A000,0180,0800,0010,139F           A[U_Q-D,CLK.UBCC,BYTE           ; CHECK THE C BIT
U 139F, 0000,013C,0180,0800,0000,1192           Z?
U 1192, 0001,203D,0180,09E8,0000,1216   =0      ERROR1,RC[0D]_Q                 ; C BIT FAILED
U 1193, 0000,003C,0180,0800,0000,1194           NOP


                                        ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;% 0
                                        ; SUBTEST 1, AND 2
                                        ;$ 7000
                                        ; SUBTEST 3, 4, 5, 6, AND 7
                                        ;$ 0C40
                                        ; SUBTST 8 AND 9
                                        ;$ 7400
                                        ; SUBTEST A
                                        ;$ 0C00
                                        ; SUBTEST B
                                        ;$ 7200
                                        ; SUBTEST C, D, AND E
                                        ;$ 2000
                                        ; SUBTEST F
                                        ;$ 0A40
                                        .PAGE   "TEST 14D       CM BRANCH ENABLE 8 -- END DP1"
                                        ;**********************************************************************
                                        ;++
                                        ; TEST  14D     CM BRANCH ENABLE 8 -- END DP1
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST CHECKS THE BRANCH ENABLE 8 IN COMPATABILITY MODE. THIS
                                        ;       BRANCH IS DEFINED AS FOLLOWS:
                                        ;
                                        ;               BIT 0 -- J CLASS + DM27
                                        ;               BIT 1 -- O CLASS
                                        ;               BIT 2 -- READ OR MODIFY
                                        ;
                                        ;       MORE THAN ONE OPCODE IS USED TO TEST THESE THREE BITS BECAUSE
                                        ;       THE GATES THAT GENERATE THESE BITS HAVE NOT ALL BEEN TESTED.
                                        ;       THE TEST IS DONE BY LOADING THE INSTRUCTION BUFFER WITH THE SPECIFIED
                                        ;       OPCODE, AND JSR'ING TO A SUBROUTINE WITH THE BRANCH ENABLED.
                                        ;       THE SUBROUTINE PUTS A NUMBER IN THE Q REGISTER THAT INDICATES WHICH
                                        ;       BRANCH BITS WERE ASSERTED AND RETURNS TO THE TEST CODE. THE Q REGISTER
                                        ;       IS THEN CHECKED FOR THE CORRECT NUMBER.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS THE LOGIC THAT GENERATES THE BRANCH SIGNALS AND
                                        ;       THE MULTIPLEXOR FOR THE BRANCH BITS ON THE IRC MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED BRANCH BITS <2:0>
                                        ;             RECEIVED BRANCH BITS <2:0>
                                        ;             LOOP COUNT -- INDICATES WHICH OP CODE IS CURRENTLY IN THE IB
                                        ;               (SEE THE DATA TABLE, AT THE END OF THIS TEST, FOR THE OPCODES)
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       ADDRESS SYNC1D--BRANCH BITS ARE ASSERTED.
                                        ;--
                                        ;**********************************************************************
                                        =0
U 1194, 0018,0039,0D80,09F8,0000,11FC   T14D:   NEWTST[.3]
U 1195, 0018,0038,6580,0A88,0000,13A0           R[1]_K[.10]                     ; INIT ADDRESS OF IB DATA
U 13A0, 0818,0038,2980,0800,0000,13A1           D_K[.34]
U 13A1, 0019,0014,0180,0A80,0000,13A2           R[0]_D+K[.8]

                                        ;/;//////////////////////////////////////////////////////////////////
                                        ;+
                                        ; START THE TEST
                                        ;-

U 13A2, 0818,0038,2180,0800,0000,13A3           D_K[.14]
U 13A3, 0019,0014,0980,09E0,0000,13A4           RC[0C]_D+K[.2]                  ; SET THE LOOP COUNT
U 13A4, 0000,003C,0180,0A00,0200,13A5   T14DL1: VA_R[0]
U 13A5, 0000,803C,0180,C800,0000,13A6           D[BYTE]_CACHE.P                 ; FETCH EXP UPC BITS
U 13A6, 0019,0034,4980,09F0,0000,1196           RC[0E]_D.AND.K[.FF]             ; SAVE
U 1196, 0000,003D,0180,0800,0000,1215   =0      ERLOOP
U 1197, 0000,003C,0180,0800,0000,1198           NOP
U 1198, 2000,003D,0180,0A08,4200,1235   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1199, 0000,003C,0180,0800,0000,119A           NOP
```

```
U 119A, 0000,003D,0180,0800,0000,125B  ;3417  =0      CALL,J/SETCM                  ; SET THE CM BIT
U 119B, 0810,0038,0180,0970,0000,119C  ;3418          D_RC[0E]                      ; GET EXPECTED UPC BITS
                                       ;3419  =0
U 119C, 0000,083D,0180,0800,0000,100C  ;3420  SYNC1D: CALL,J/REIENT,END.DP1?        ; EXECUTE THE BRANCH
U 119D, 0019,2000,11C0,0800,0000,13A7  ;3421          Q_Q-K[.4]                     ; ADJUST FOR UPC BIT 2
U 13A7, 001D,A000,0180,0800,0010,13A8  ;3422          A[U_Q-D,CLK.UBCC,BYTE         ; CHECK
U 13A8, 0000,013C,0180,0800,0000,119E  ;3423          Z?
U 119E, 0001,203D,0180,09E8,0000,1218  ;3424  =0      ERROR2,RC[0D]_Q               ; BEN 8 FAILED
U 119F, 0000,003C,0180,0A00,0000,13A9  ;3425          LAB_R[0]
U 13A9, 0018,0014,0580,0A80,0000,13AA  ;3426          R[0]_LA+K[.1]                 ; INCREMENT ADR OF EXPECTED DATA
U 13AA, 0000,003C,0180,0A08,0000,13AB  ;3427          LAB_R[1]
U 13AB, 0018,0014,0980,0A88,0000,13AC  ;3428          R[1]_LA+K[.2]                 ; INCREMENT ADR OF IB DATA
U 13AC, 0810,0038,0180,0960,0000,13AD  ;3429          D_RC[0C]
U 13AD, 0019,8000,0580,09E0,0010,13AE  ;3430          RC[0C]_D-K[.1],CLK.UBCC,BYTE  ; CHECK THE LOOP COUNT
U 13AE, 0000,013C,0180,0800,0000,11A0  ;3431          Z?
U 11A0, 0000,003C,0180,0800,0000,13A4  ;3432  =0      J/T14DL1                      ; CONTINUE
U 11A1, 0000,003C,0180,0800,0000,13AF  ;3433          NOP
                                       ;3434
                                       ;3435
                                       ;3436  ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                       ;3437  ;% 10
                                       ;3438  ; UPC BITS<2:0>=000, LOOP COUNT = 16 THRU 0D
                                       ;3439  ;$ 0010,001F,0007,0037,0000,00C0,0140,0C00,2800,0A00
                                       ;3440  ; OCTAL DATA OF THE ABOVE HEX DATA:
                                       ;3441  ; 000020,000037,000007,000067,000000,000300,000500,006000,024000,005000
                                       ;3442  ;
                                       ;3443  ; UPC<2:0>=001, LOOP COUNT 0C THRU 0A
                                       ;3444  ;$ 0017,0040,0800
                                       ;3445  ; OCTAL DATA OF THE ABOVE HEX DATA:
                                       ;3446  ; 000027,000100,004000
                                       ;3447  ;
                                       ;3448  ; UPC<2:0>=010, LOOP COUNT 09 THRU 03
                                       ;3449  ;$ 0580,0980,0C80,0D00,0DC0,3000,5000
                                       ;3450  ; OCTAL DATA OF THE ABOVE HEX DATA:
                                       ;3451  ; 002600,004600,006200,006400,006700,030000,050000
                                       ;3452  ;
                                       ;3453  ; UPC BITS<2:0>=100, LOOP COUNT 02 AND 01
                                       ;3454  ;$ 0D80,1000
                                       ;3455  ; OCTAL EQUIVALENT OF THE ABOVE HEX DATA:
                                       ;3456  ; 006600,010000
                                       ;3457  ;
                                       ;3458  ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                       ;3459  ;% 3C
                                       ;3460  ;$ 0000,0000,0000,0000,0000,0101.0001,0001,0000,0000,0202
                                       ;3461
                                       ;3462
```

```
                                              .PAGE   "TEST 14E       CM BRANCH ENABLE 9 -- PC MODES"
                                              ;*******************************************************************
                                              ;++
                                              ; TEST  14E     CM BRANCH ENABLE 9 -- PC MODES
                                              ;
                                              ; TEST DESCRIPTION
                                              ;       THIS TEST CHECKS THE BRANCH ENABLE 9 IN COMPATABILITY MODE. THE
                                              ;       BRANCH BITS ARE DEFINED AS FOLLOWS:
                                              ;
                                              ;               BIT 0 - DST R = PC
                                              ;               BIT 1 - SM + DM 47 + 57
                                              ;
                                              ;       THE TEST USES MORE THAN ONE OPCODE TO TEST THE LOGIC THAT GENERATES
                                              ;       THESE SIGNALS.
                                              ;       THE TEST IS PERFORMED BY LOADING THE OPCODE INTO THE INSTRUCTION
                                              ;       BUFFER AND JSR'ING TO A SUBROUTINE WITH THE BRANCH ENABLED.
                                              ;       THE SUBROUTINE PUTS A NUMBER IN THE Q REGISTER THAT CORRESPONDS
                                              ;       TO THE BRANCH BITS THAT ASSERTED AND RETURNS TO THE TEST.
                                              ;       THE Q REGISTER IS THEN CHECKED FOR THE CORRECT DATA.
                                              ;
                                              ; LOGIC DESCRIPTION
                                              ;       THIS TEST CHECKS THE LOGIC ON THE IRC MODULE THAT GENERATES THE
                                              ;       BRANCH BITS.
                                              ;
                                              ; ERROR DESCRIPTION
                                              ;       DATA: EXPECTED UPC BITS <1:0>
                                              ;             RECEIVED UPC BITS <1:0>
                                              ;             LOOP COUNT -- DESCRIBES WHICH DATA PATTERN IS CURRENTLY
                                              ;               IN THE INSTRUCTION BUFFER. (SEE THE DATA TABLE AT THE END
                                              ;               OF THIS TEST)
                                              ;
                                              ; SYNC POINT DESCRIPTION
                                              ;       ADDRESS - SYNC1E--BRANCH BITS ARE ACTIVE
                                              ;--
                                              ;*******************************************************************
U 13AF, 0018,0039,0D80,09F8,0000,11FC         T14E:   NEWTST[.3]
U 13B0, 0818,0038,3580,0800,0000,13B1                 D_K[.50]
U 13B1, 0019,0014,1180,0A88,0000,11A2                 R[1]_D+K[.4]                    ; SET ADDRESS OF IB DATA 54(16)
U 11A2, 0816,0039,D580,0800,0000,121E         =0      D_K[.6],CALL,J/DC4
U 11A3, 0001,003C,0180,0A80,0000,13B2                 R[0]_D

                                              ;//////////////////////////////////////////////////////////////////////
                                              ;+
                                              ; START THE TEST
                                              ;-

U 13B2, 0018,0038,0180,09E0,0000,13B3         T14ES1: RC[0C]_K[.8]                    ; SET THE LOOP COUNT
U 13B3, 0000,003C,0180,0A00,0200,13B4         T14EL1: VA_R[0]
U 13B4, 0000,803C,0180,C800,0000,13B5                 D[BYTE]_CACHE.P                 ; FETCH EXPECTED DATA
U 13B5, 0019,0034,4980,09F0,0000,11A4                 RC[0E]_D.AND.K[.FF]             ; SAVE
U 11A4, 0000,003D,0180,0800,0000,1215         =0      ERLOOP
U 11A5, 0000,003C,0180,0800,0000,11A6                 NOP
U 11A6, 2000,003D,0180,0A08,4200,1235         =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11A7, 0000,003C,0180,0800,0000,11A8                 NOP
U 11A8, 0000,003D,0180,0800,0000,125B         =0      CALL,J/SETCM                    ; SET THE CM BIT
```

```
U 11A9, 0810,0038,0180,0970,0000,11AA   ;3518           D_RC[0E]                        ; GET EXPECTED DATA
                                        ;3519   =0
U 11AA, 0000,093D,0180,0800,0000,1008   ;3520   SYNC1E: CALL,J/IBBRTABLE,PC.MODES?      ; EXECUTE THE BRANCH
U 11AB, 001D,A000,0180,0800,0010,13B6   ;3521           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 13B6, 0000,013C,0180,0800,0000,11AC   ;3522           Z?
U 11AC, 0001,203D,0180,09E8,0000,1218   ;3523   =0      ERROR2,RC[0D]_Q                 ; BEN 9 FAILED
U 11AD, 0000,003C,0180,0A00,0000,13B7   ;3524           LAB_R[0]
U 13B7, 0018,0014,0580,0A80,0000,13B8   ;3525           R[0]_LA+K[.1]                   ; INCREMENT ADR OF EXP DATA
U 13B8, 0000,003C,0180,0A08,0000,13B9   ;3526           LAB_R[1]
U 13B9, 0018,0014,0980,0A88,0000,13BA   ;3527           R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 13BA, 0810,0038,0180,0960,0000,13BB   ;3528           D_RC[0C]
U 13BB, 0019,8000,0580,09E0,0010,13BC   ;3529           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 13BC, 0000,013C,0180,0800,0000,11AE   ;3530           Z?
U 11AE, 0000,003C,0180,0800,0000,13B3   ;3531   =0      J/T14EL1                        ; CONTINUE
U 11AF, 0000,003C,0180,0800,0000,11B0   ;3532           NOP
                                        ;3533
                                        ;3534   ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;3535   ;% 54
                                        ;3536   ; LOOP COUNT = 8 THRU 1
                                        ;3537   ;$ 0800,01C0,0DC0,0020,0007,0037,09C0,0027
                                        ;3538   ; OCTAL EQUIVALENT FOR THE ABOVE HEX DATA:
                                        ;3539   ; 004000,016000,006700,000040,000007,000067,004700,000047
                                        ;3540   ;
                                        ;3541   ; FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                        ;3542   ;% 64
                                        ;3543   ;$ 0000,0000,0101,0302
                                        ;3544
                                        ;3545
```

```
                                              .PAGE   "TEST 14F       CM BRANCH ENABLE A -- REI"
                                              ;*********************************************************************
                                              ;++
                                              ; TEST  14F     CM BRANCH ENABLE A -- REI
                                              ;
                                              ; TEST DESCRIPTION
                                              ;       THIS TEST CHECKS THE BRANCH ENABLE A BITS IN COMPATABILITY MODE.
                                              ;       THE BITS ARE DEFINED AS FOLLOWS:
                                              ;
                                              ;               BIT 0 - SRC R = PC
                                              ;
                                              ;       THE BIT IS TESTED FIRST IN THE SET CONDITION AND THEN IN THE CLEAR
                                              ;       CONDITION.
                                              ;
                                              ; LOGIC DESCRIPTION
                                              ;       THIS TEST CHECKS THE LOGIC ON THE IRC MODULE THAT GENERATES BIT
                                              ;       0 DURING BRANCH ENABLE A.
                                              ;
                                              ; ERROR DESCRIPTION
                                              ;       DATA: EXPECTED BRANCH BITS <2:0>
                                              ;             RECEIVED BRANCH BITS <2:0>
                                              ;             LOOP COUNT -- INDICATES WHETHER THE BIT SHOULD BE ASSERTED
                                              ;               ( LOOP COUNT = 2) OR DEASSERTED (LOOP COUNT =1).
                                              ;
                                              ; SYNC POINT DESCRIPTION
                                              ;       ADDRESS SYNC1F--BRANCH BITS ARE ACTIVE
                                              ;--
                                              ;*********************************************************************
                                              =0
U 11B0, 0000,003D,0180,0800,0000,11FC         T14F:   NEWTST
U 11B1, 0018,0038,1180,09F8,0000,11B2                 RC[OF]_K[.4]                    ; 4 ARGUMENTS FOR TYPEOUT
U 11B2, 0818,0039,D580,0800,0000,1226         =0      D_K[.6],CALL,J/DCC              ; GEN ADDRESS OF IB DATA
U 11B3, 0001,003C,0180,0A88,0000,11B4                 R[1]_D                          ; SAVE
U 11B4, 0818,0039,5D80,0800,0000,121A         =0      D_K[.7],CALL,J/DCO              ; GEN ADDRESS OF EXP DATA
U 11B5, 0001,003C,0180,0A80,0000,13BD                 R[0]_D                          ; SAVE

                                              ;////////////////////////////////////////////////////////////////////
                                              ;+
                                              ; START THE TEST
                                              ;-

U 13BD, 0018,0038,0980,09E0,0000,13BE         T14FS1: RC[OC]_K[.2]                    ; SET THE LOOP COUNT
U 13BE, 0000,003C,0180,0A00,0200,13BF         T14FL1: VA_R[0]
U 13BF, 0000,803C,0180,C800,0000,13C0                 D[BYTE]_CACHE.P                 ; FETCH THE EXP DATA
U 13C0, 0019,0034,4980,09F0,0000,11B6                 RC[OE]_D.AND.K[.FF]             ; SAVE
U 11B6, 0000,003D,0180,0800,0000,1215         =0      ERLOOP
U 11B7, 0000,003C,0180,0800,0000,11B8                 NOP
U 11B8, 2000,003D,0180,0A08,4200,1235         =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11B9, 0000,003C,0180,0800,0000,11BA                 NOP
U 11BA, 0000,003D,0180,0800,0000,125B         =0      CALL,J/SETCM                    ; SET THE CM BIT
U 11BB, 0810,0038,0180,0970,0000,11BC                 D_RC[OE]                        ; GET EXPECTED DATA
                                              =0
U 11BC, 0000,0A3D,0180,0800,0000,100C         SYNC1F: CALL,J/REIENT,BEN/REI           ; EXECUTE THE BRANCH
U 11BD, 0019,2000,11C0,0800,0000,13C1                 Q_Q-K[.4]                       ; ADJUST FOR BIT 2
U 13C1, 001D,A000,0180,0800,0010,13C2                 ALU_Q-D,CLK.URCC,BYTE           ; CHECK
```

```
U 13C2, 0000,013C,0180,0800,0000,11BE   ;3601          Z?
U 11BE, 0001,203D,0180,09E8,0000,1218   ;3602   =0     ERROR2,RC[0D]_Q                  ; BEN A FAILED
U 11BF, 0000,003C,0180,0A00,0000,13C3   ;3603          LAB_R[0]
U 13C3, 0018,0014,0580,0A80,0000,13C4   ;3604          R[0]_LA+K[.1]                    ; INCREMENT ADR OF EXP DATA
U 13C4, 0000,003C,0180,0A08,0000,13C5   ;3605          LAB_R[1]
U 13C5, 0018,0014,0980,0A88,0000,13C6   ;3606          R[1]_LA+K[.2]                    ; INCREMENT ADR OF IB DATA
U 13C6, 0810,0038,0180,0960,0000,13C7   ;3607          D_RC[0C]
U 13C7, 0019,8000,0580,09E0,0010,13C8   ;3608          RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; CHECK LOOP COUNT
U 13C8, 0000,013C,0180,0800,0000,11C0   ;3609          Z?
U 11C0, 0000,003C,0180,0800,0000,13BE   ;3610   =0     J/T14FL1                         ; CONTINUE
U 11C1, 0000,003C,0180,0800,0000,11C2   ;3611          NOP
                                        ;3612
                                        ;3613   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;3614   ;% 6C
                                        ;3615   ;$ 0000,01C0
                                        ;3616   ; OCTAL EQUIVALENT FOR THE ABOVE OPCODES:
                                        ;3617   ; 000000,000700
                                        ;3618   ;
                                        ;3619   ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                        ;3620   ;% 70
                                        ;3621   ;$ 0100
                                        ;3622   ;
                                        ;3623   ; THE FOLLOWING LONG WORD IS RESERVED FOR THE CANCEL TESTS.
                                        ;3624   ;% 80
                                        ;3625   ;$ 0000,0000
                                        ;3626
                                        ;3627  .PAGE   "TEST 150       VAX MODE BRANCH ENABLE 8 -- DATA TYPE"
                                        ;3628  ;*******************************************************************
                                        ;3629  ;++
                                        ;3630  ; TEST  150     VAX MODE BRANCH ENABLE 8 -- DATA TYPE
                                        ;3631  ;
                                        ;3632  ; TEST DESCRIPTION
                                        ;3633  ;       THIS TEST CHECKS THE FUNCTIONS THAT ASSERT THE BITS OF THE DATA
                                        ;3634  ;       TYPE BRANCH. SINCE SOME OF THESE FUNCTIONS, SUCH AS ASRC AND VSRC,
                                        ;3635  ;       ARE NOT ACTIVE AT DECISION POINT 0, CERTAIN OP CODES ARE ADVANCED
                                        ;3636  ;       TO DECISION POINT 1 OR 2 DEPENDING ON WHEN THE SIGNALS GO ACTIVE.
                                        ;3637  ;       THE BRANCH IS EXECUTED BY JSR'ING TO A TABLE THAT PUTS
                                        ;3638  ;       A NUMBER IN THE Q REGISTER CORRESPONDING TO THE BRANCH BITS THAT
                                        ;3639  ;       ASSERTED. THE TABLE RETURNS TO THE TEST CODE WHERE THE Q REGISTER
                                        ;3640  ;       IS CHECKED FOR THE CORRECT DATA.
                                        ;3641  ;
                                        ;3642  ;       SUBTST1 - CHECK THOSE OP CODES THAT CAN BE EXECUTED AT DECISION
                                        ;3643  ;                 POINT 1.
                                        ;3644  ;       SUBTST 2 - CHECK THOSE OPCODES THAT MUST BE EXECUTED AT DECISION
                                        ;3645  ;                  POINT 2
                                        ;3646  ;       SUBTST 3 - CHECK THOSE OPCODES THAT MUST BE EXECUTED AT DECISION
                                        ;3647  ;                  POINT 3.
                                        ;3648  ;
                                        ;3649  ; LOGIC DESCRIPTION
                                        ;3650  ;       THIS TEST CHECKS THE BRANCH MULTIPLEXOR ON THE IRC MODULE AND THE
                                        ;3651  ;       USC MODULE.
                                        ;3652  ;
                                        ;3653  ; ERROR DESCRIPTION
                                        ;3654  ;       DATA: EXPECTED BRANCH BITS <2:0>
                                        ;3655  ;             RECEIVED BRANCH BITS <2:0>
                                        ;3656  ;             LOOP COUNT - INIDCATES WHICH OP CODE IS CURRENTLY BE USED
                                        ;3657  ;               TO GENERATE THE BRANCH CONDITIONS. ( SEE THE DATA TABLE
                                        ;3658  ;               AT THE END OF THIS TEST). SUBTST 1 ONLY.
                                        ;3659  ;
                                        ;3660  ; SYNC POINT DESCRIPTION
                                        ;3661  ;       SUBTST 1 - SYNC20--BRANCH BITS SHOULD BE STABLE
                                        ;3662  ;       SUBTST 2 - SYNC21--BRANCH BITS SHOULD BE STABLE
                                        ;3663  ;       SUBTST 3 - SYNC22--BRANCH BITS SHOULD BE STABLE
                                        ;3664  ;--
                                        ;3665  ;*******************************************************************
                                        ;3666  =0
U 11C2, 0018,0039,0D80,09F8,0000,11FC   ;3667  T150:   NEWTST[.3]
U 11C3, 0018,0038,0D80,09E0,0000,11C4   ;3668          RC[0C]_K[.3]               ; SET THE LOOP COUNT
U 11C4, 0818,0039,0580,0800,0000,1220   ;3669  =0      D_K[.1],CALL,J/DC6
U 11C5, 0000,003C,0180,0800,0000,11C6   ;3670          NOP
U 11C6, 0000,003D,0180,0800,0000,1222   ;3671  =0      CALL,J/DC8
U 11C7, 0001,003C,0180,0A88,0000,11C8   ;3672          R[1]_D                     ; ADR OF IB DATA
U 11C8, 0818,0039,0580,0800,0000,1221   ;3673  =0      D_K[.1],CALL,J/DC7
U 11C9, 0000,003C,0180,0800,0000,11CA   ;3674          NOP
U 11CA, 0000,003D,0180,0800,0000,121E   ;3675  =0      CALL,J/DC4
U 11CB, 0001,003C,0180,0A80,0000,11CC   ;3676          R[0]_D
                                        ;3677
                                        ;3678  ;///////////////////////////////////////////////////////////////////
                                        ;3679  ;+
                                        ;3680  ; CHECK THOSE FUNCTIONS THAT CAN BE TESTED AT DECISION POINT 0
                                        ;3681  ;-
                                        ;3682
                                        ;3683   =0
U 11CC, 0000,003D,0180,0800,0000,122F   ;3684   T150S1: SUBTEST
U 11CD, 0000,003C,0180,0A00,0200,13C9   ;3685   T150L1: VA_R[0]
U 13C9, 0000,803C,0180,C800,0000,13CA   ;3686           D[BYTE]_CACHE.P                 ; GET EXP UPC BITS
U 13CA, 0019,0034,4980,09F0,0000,11CE   ;3687           RC[0E]_D.AND.K[.FF]             ; SAVE
U 11CE, 0000,003D,0180,0800,0000,1215   ;3688   =0      ERLOOP
U 11CF, 0810,0038,0180,0970,0000,11D0   ;3689           D_RC[0E]
U 11D0, 2000,003D,0180,0A08,4200,1235   ;3690   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11D1, 0000,003C,0180,0800,0000,11D2   ;3691           NOP
U 11D2, 0000,003D,0180,0800,0000,1234   ;3692   =0      CALL,J/DISPAT                   ; LATCH THE BRANCH BITS
U 11D3, 0000,003C,0180,0800,0000,11D4   ;3693           NOP
                                        ;3694   =0
U 11D4, 0000,083D,0180,0800,0000,1008   ;3695   SYNC20: CALL,J/IBBRTABLE,DATA.TYPE?     ; EXECUTE THE BRANCH
U 11D5, 001D,A000,0180,0800,0010,13CB   ;3696           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 13CB, 0000,013C,0180,0800,0000,11D6   ;3697           Z?
U 11D6, 0001,203D,0180,09E8,0000,1218   ;3698   =0      ERROR2,RC[0D]_Q
                                        ;3699
                                        ;3700   ;+
                                        ;3701   ; THE FOLLOWING CODE IS USED FOR LOOP CONTROL OF THIS SUBTEST
                                        ;3702   ;-
                                        ;3703
U 11D7, 0000,003C,0180,0A00,0000,13CC   ;3704           LAB_R[0]
U 13CC, 0018,0014,0580,0A80,0000,13CD   ;3705           R[0]_LA+K[.1]                   ; INCREMENT ADR OF EXP DATA
U 13CD, 0000,003C,0180,0A08,0000,13CE   ;3706           LAB_R[1]
U 13CE, 0018,0014,0980,0A88,0000,13CF   ;3707           R[1]_LA+K[.2]                   ; INCREMENT ADR OF IB DATA
U 13CF, 0810,0038,0180,0960,0000,13D0   ;3708           D_RC[0C]
U 13D0, 0019,8000,0580,09E0,0010,13D1   ;3709           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK LOOP COUNT
U 13D1, 0000,013C,0180,0800,0000,11D8   ;3710           Z?
U 11D8, 0000,003C,0180,0800,0000,11CD   ;3711   =0      J/T150L1                        ; CONTINUE
                                        ;3712
                                        ;3713   ;////////////////////////////////////////////////////////////////////
                                        ;3714   ;+
                                        ;3715   ; NOW CHECK CONDITION REQUIRING THE EXEC CT TO BE =1
                                        ;3716   ;-
                                        ;3717
U 11D9, 0000,003C,0180,0A00,0200,11DA   ;3718   T150S2: VA_R[0]                         ; LOAD ADR OF EXP UPC BITS
U 11DA, 0000,003D,0180,0800,0000,122F   ;3719   =0      SUBTEST
U 11DB, 0000,803C,0180,C800,0000,13D2   ;3720           D[BYTE]_CACHE.P                 ; GET EXP UPC BITS
U 13D2, 0019,0034,4980,09F0,0000,11DC   ;3721           RC[0E]_D.AND.K[.FF]             ; SAVE
U 11DC, 0000,003D,0180,0800,0000,1215   ;3722   =0      ERLOOP
U 11DD, 0810,0038,0180,0970,0000,11DE   ;3723           D_RC[0E]
U 11DE, 2000,003D,0180,0A08,4200,1235   ;3724   =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11DF, D000,003C,0180,0800,0000,11E0   ;3725           IBC7CLR.1                       ; ADVANCE EXECUTION POINT COUNTER
U 11E0, 0000,003D,0180,0800,0000,1234   ;3726   =0      CALL,J/DISPAT                   ; LATCH BRANCH BITS FROM B FORK
U 11E1, 0000,003C,0180,0800,0000,11E2   ;3727           NOP
                                        ;3728   =0
U 11E2, 0000,083D,0180,0800,0000,1008   ;3729   SYNC21: CALL,J/IBBRTABLE,DATA.TYPE?     ; EXECUTE THE BRANCH
U 11E3, 001D,A000,0180,0800,0010,13D3   ;3730           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 13D3, 0000,013C,0180,0800,0000,11E4   ;3731           Z?
U 11E4, 0001,203D,0180,09E8,0000,1218   ;3732   =0      ERROR2,RC[0D]_Q
                                        ;3733
                                        ;3734
                                        ;3735   ;////////////////////////////////////////////////////////////////////
                                        ;3736   ;+
                                        ;3737    ; NOW CHECK BRANCH CONDITION REQUIRING THE EXC CT TO BE =2
                                        ;3738    ;-
                                        ;3739
U 11E5, 0000,003C,0180,0A00,0000,13D4   ;3740    T150S3: LAB_R[0]
U 13D4, 0018,0014,0580,0A80,0000,11E6   ;3741            R[0]_LA+K[.1]
U 11E6, 0000,003D,0180,0800,0000,122F   ;3742    =0      SUBTEST
U 11E7, 0000,003C,0180,0A08,0000,13D5   ;3743            LAB_R[1]
U 13D5, 0018,0014,0980,0A88,0000,13D6   ;3744            R[1]_LA+K[.2]
U 13D6, 0000,003C,0180,0A00,0200,13D7   ;3745            VA_R[0]                         ; LOAD ADR OF EXP UPC BITS
U 13D7, 0000,803C,0180,C800,0000,13D8   ;3746            D[BYTE]_CACHE.P                 ; GET EXP UPC BITS
U 13D8, 0019,0034,4980,09F0,0000,11E8   ;3747            RC[0E]_D.AND.K[.FF]             ; SAVE
U 11E8, 0000,003D,0180,0800,0000,1215   ;3748    =0      ERLOOP
U 11E9, 0810,0038,0180,0970,0000,11EA   ;3749            D_RC[0E]
U 11EA, 2000,003D,0180,0A08,4200,1235   ;3750    =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 11EB, D000,003C,0180,0800,0000,13D9   ;3751            IBC/CLR.1
U 13D9, D000,003C,0180,0800,0000,11EC   ;3752            IBC/CLR.1                       ; ADVANCE EXECUTION POINT COUNTER
U 11EC, 0000,003D,0180,0800,0000,1234   ;3753    =0      CALL,J/DISPAT                   ; LATCH BRANCH BITS FROM C FORK
U 11ED, 0000,003C,0180,0800,0000,11EE   ;3754            NOP
                                        ;3755    =0
U 11EE, 0000,083D,0180,0800,0000,1008   ;3756    SYNC22: CALL,J/IBBRTABLE,DATA.TYPE?     ; EXECUTE THE BRANCH
U 11EF, 001D,A000,0180,0800,0010,13DA   ;3757            ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 13DA, 0000,013C,0180,0800,0000,11F0   ;3758            Z?
U 11F0, 0001,203D,0180,09E8,0000,1218   ;3759    =0      ERROR2,RC[0D]_Q
U 11F1, 0000,003C,0180,0800,0000,11F2   ;3760            NOP
                                        ;3761
                                        ;3762
                                        ;3763    ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;3764    ;% 168
                                        ;3765    ; SUBTST 1, LOOP COUNT 3 THRU 1
                                        ;3766    ;$ 6094
                                        ;3767    ;$ 6096
                                        ;3768    ;$ 600B
                                        ;3769    ; SUBTST 2
                                        ;3770    ;$ 6056
                                        ;3771    ; SUBTST 3
                                        ;3772    ;$ 60E0
                                        ;3773    ;
                                        ;3774    ; THE FOLLOWING IS THE EXPECTED UPC BITS FOR THE ABOVE TEST:
                                        ;3775    ;% 174
                                        ;3776    ;$ 0400,0107,0002
                                        ;3777    =0
U 11F2, 0000,003D,0180,0800,0000,11FC   ;3778    T151:   NEWTST
U 11F3, 0000,003C,0180,0800,0000,11F4   ;3779            NOP
                                        ;3780    =0
U 11F4, 0000,003D,0180,0800,0000,11FC   ;3781    T152:   NEWTST
U 11F5, 0000,003C,0180,0800,0000,13DB   ;3782            NOP
U 13DB, 0000,003D,0180,0800,0000,11FC   ;3783    ENDTST: NEWTST
                                        ;3784
```

```
ZZ-ESKAH-V132  Line Number Index
ESKAH39.MCR                    MICRO2  1M(01)    16-DEC-82  12:30:35
;                             Location / Line Number Index

;Location         0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - OFFF Unused
U 1000            1876:    1845     1847=    1866=    1867=    1868=    1884=    1885=
U 1008            2102=    2103=    2104=    2105=    2106=    2107=    2108=    2109=
U 1010            2065=    2066=    2067=    2068=    2150=    2151=    2152=    2153=
U 1018            2165=    2166=    2167=    2168=    2169=    2170=    2171=    2172=
U 1020            2184=    2190=    2196=    2197=    2201=    2209=    2211=    2212=
U 1028            2217=    2218=    2219=    2220=    2221=    2222=    2234=    2240=
U 1030            2246=    2247=    2251=    2259=    2261=    2262=    2267=    2268=
U 1038            2269=    2270=    2271=    2272=    2284=    2290=    2296=    2297=
U 1040            2301=    2302=    2354=    2355=    2356=    2357=    2358=    2359=
U 1048            2361=    2362=    2364=    2365=    2373=    2374=    1920:    1846
U 1050            2375=    2376=    2377=    2378=    2388=    2397=    2399=    2400=
U 1058            2401=    2402=    1924:    1869     2404=    2405=    1928:    1870
U 1060            2406=    2407=    2408=    2409=    2414=    2420=    2429=    2437=
U 1068            2438=    2439=    2441=    2442=    2443=    2444=    2445=    2446=
U 1070            2451=    2457=    2466=    2474=    2475=    2476=    2478=    2479=
U 1078            2480=    2481=    2482=    2483=    2488=    2494=    2501=    2502=
U 1080            2575=    2582=    2583=    2584=    2585=    2586=    2589=    2590=
U 1088            2596=    2603=    2604=    2605=    2606=    2607=    2609=    2610=
U 1090            2616=    2617=    2646=    2653=    2654=    2655=    2656=    2657=
U 1098            2659=    2660=    2666=    2673=    2674=    2675=    2676=    2677=
U 10A0            2679=    2680=    2686=    2687=    2718=    2725=    2726=    2727=
U 10A8            2728=    2729=    2731=    2732=    2738=    2745=    2746=    2747=
U 10B0            2748=    2749=    2751=    2752=    2758=    2759=    2798=    2805=
U 10B8            2806=    2807=    2808=    2809=    2811=    2812=    2818=    2825=
U 10C0            2826=    2827=    2828=    2829=    2831=    2832=    2838=    2845=
U 10C8            2846=    2847=    2848=    2849=    2851=    2852=    2858=    2865=
U 10D0            2866=    2867=    2868=    2869=    2871=    2872=    2878=    2879=
U 10D8            2938=    2939=    2947=    2948=    2949=    2950=    2951=    2952=
U 10E0            2956=    2957=    2963=    2970=    2971=    2972=    2973=    2974=
U 10E8            2975=    2976=    2980=    2981=    2982=    2983=    2988=    2995=
U 10F0            2996=    2997=    3001=    3002=    3003=    3004=    3008=    3009=
U 10F8            3010=    3011=    3018=    3025=    3026=    3027=    3028=    3029=
U 1100            1831:    1832:    1833:    1834:    1835:    1836:    1837:    1838:
U 1108            1839:    1871     3030=    3031=    1840:    1841:    1842:    1843:
U 1110            3035=    3036=    3037=    3038=    3045=    3053=    3054=    3055=
U 1118            3057=    3058=    3059=    3060=    3064=    3065=    3066=    3067=
U 1120            3074=    3081=    3082=    3083=    3085=    3086=    3087=    3088=
U 1128            3092=    3093=    3094=    3095=    3102=    3109=    3110=    3111=
U 1130            3112=    3113=    3114=    3115=    3119=    3120=    3121=    3122=
U 1138            3129=    3136=    3137=    3138=    3142=    3143=    3144=    3145=
U 1140            3149=    3150=    3151=    3152=    3159=    3166=    3167=    3168=
U 1148            3169=    3170=    3171=    3172=    3176=    3177=    3178=    3179=
U 1150            3186=    3193=    3194=    3195=    3198=    3199=    3200=    3201=
U 1158            3205=    3206=    3207=    3208=    3213=    3220=    3221=    3222=
U 1160            3224=    3225=    3226=    3227=    3231=    3232=    3238=    3246=
U 1168            3247=    3248=    3250=    3251=    3252=    3253=    3257=    3258=
U 1170            3264=    3272=    3273=    3274=    3275=    3276=    3277=    3278=
U 1178            3282=    3283=    3284=    3285=    3290=    3297=    3298=    3299=
U 1180            3300=    3301=    3302=    3303=    3307=    3308=    3309=    3310=
U 1188            3315=    3322=    3323=    3324=    3326=    3327=    3328=    3329=
U 1190            3333=    3334=    3339=    3340=    3398=    3399=    3413=    3414=
U 1198            3415=    3416=    3417=    3418=    3420=    3421=    3424=    3425=
;Location          0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 11A0             3432=    3433=    3501=    3502=    3513=    3514=    3515=    3516=
U 11A8             3517=    3518=    3520=    3521=    3523=    3524=    3531=    3532=
U 11B0             3575=    3576=    3577=    3578=    3579=    3580=    3591=    3592=
U 11B8             3593=    3594=    3595=    3596=    3598=    3599=    3602=    3603=
U 11C0             3610=    3611=    3667=    3668=    3669=    3670=    3671=    3672=
U 11C8             3673=    3674=    3675=    3676=    3684=    3685=    3688=    3689=
U 11D0             3690=    3691=    3692=    3693=    3695=    3696=    3698=    3704=
U 11D8             3711=    3718=    3719=    3720=    3722=    3723=    3724=    3725=
U 11E0             3726=    3727=    3729=    3730=    3732=    3740=    3742=    3743=
U 11E8             3748=    3749=    3750=    3751=    3753=    3754=    3756=    3757=
U 11F0             3759=    3760=    3778=    3779=    3781=    3782=    1872     1873
U 11F8             1874     1875     1882     1883     1897     1898     1899     1900
U 1200             2022:    1901     2023:    1902     2024:    1903     2025:    1904
U 1208             2026:    1905     1906     1907     1908     1909     1910     1911
U 1210             1912     1913     1914     1915     1916     1917     1918     1919
U 1218             1922     1923     1966     1967     1968     1969     1970     1971
U 1220             1972     1973     1974     1975     1976     1977     1978     1979
U 1228             1980     1981     1983     1984     1985     1986     1988     1998
U 1230             1999     2007     2008     2009     2019     2046     2047     2048
U 1238             2049     2050     2051     2052     2056     2057     2058     2059
U 1240             2060     2061     2062     2063     2064     2027:    2072     2028:
U 1248             2073     2074     2075     2076     2077     2078     2079     2029:
U 1250             2083     2030:    2084     2031:    2085     2086     2087     2032:
U 1258             2088     2089     2090     2093     2094     2095     2096     2097
U 1260             2110     2154     2155     2156     2164     2173     2174     2175
U 1268             2176     2177     2178     2179     2180     2181     2182     2183
U 1270             2191     2192     2193     2194     2195     2198     2199     2200
U 1278             2210     2213     2214     2215     2216     2223     2224     2225
U 1280             2226     2227     2228     2229     2230     2231     2232     2233
U 1288             2241     2242     2243     2244     2245     2248     2249     2033:
U 1290             2250     2260     2263     2264     2265     2266     2273     2274
U 1298             2275     2276     2277     2278     2279     2280     2281     2282
U 12A0             2283     2291     2292     2293     2294     2295     2298     2299
U 12A8             2300     2360     2036:    2363     2379     2380     2381     2382
U 12B0             2383     2384     2385     2386     2387     2398     2410     2411
U 12B8             2034:    2412     2413     2035:    2421     2422     2423     2424
U 12C0             2425     2426     2427     2428     2447     2448     2449     2450
U 12C8             2458     2459     2460     2461     2462     2463     2464     2465
U 12D0             2477     2484     2485     2486     2487     2495     2496     2497
U 12D8             2498     2499     2500     2587     2588     2591     2592     2593
U 12E0             2594     2595     2608     2611     2612     2613     2614     2615
U 12E8             2658     2661     2662     2663     2664     2665     2678     2681
U 12F0             2682     2683     2684     2685     2730     2733     2734     2735
U 12F8             2736     2737     2750     2753     2754     2755     2756     2757
U 1300             2810     2813     2814     2815     2816     2817     2830     2833
U 1308             2834     2835     2836     2837     2850     2853     2854     2855
U 1310             2856     2857     2870     2873     2874     2875     2876     2877
U 1318             2946     2953     2954     2955     2958     2959     2960     2961
U 1320             2962     2977     2978     2979     2984     2985     2986     2987
U 1328             2998     2999     3000     3005     3006     3007     3012     3013
U 1330             3014     3015     3016     3017     3032     3033     3034     3039
U 1338             3040     3041     3042     3043     3044     3056     3061     3062
U 1340             3063     3068     3069     3070     3071     3072     3073     3084
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348           3089    3090    3091    3096    3097    3098    3099    3100
U 1350           3101    3116    3117    3118    3123    3124    3125    3126
U 1358           3127    3128    3139    3140    3141    3146    3147    3148
U 1360           3153    3154    3155    3156    3157    3158    3173    3174
U 1368           3175    3180    3181    3182    3183    3184    3185    3196
U 1370           3197    3202    3203    3204    3209    3210    3211    3212
U 1378           3223    3228    3229    3230    3233    3234    3235    3236
U 1380           3237    3249    3254    3255    3256    3259    3260    3261
U 1388           3262    3263    3279    3280    3281    3286    3287    3288
U 1390           3289    3304    3305    3306    3311    3312    3313    3314
U 1398           3325    3330    3331    3332    3335    3336    3337    3338
U 13A0           3400    3401    3408    3409    3410    3411    3412    3422
U 13A8           3423    3426    3427    3428    3429    3430    3431    3498
U 13B0           3499    3500    3509    3510    3511    3512    3522    3525
U 13B8           3526    3527    3528    3529    3530    3587    3588    3589
U 13C0           3590    3600    3601    3604    3605    3606    3607    3608
U 13C8           3609    3686    3687    3697    3705    3706    3707    3708
U 13D0           3709    3710    3721    3731    3741    3744    3745    3746
U 13D8           3747    3752    3758    3783
U 13E0 - 13EF Unused
U 13F0           1934:   1935:   1936:   1937:   1938:   1939:   1940:   1941:
U 13F8           1942:   1943:   1944:   1945:   1946:   1947:   1948:   1949:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH39       1004

Used            1004
Remaining

Total microwords used in memory U: 1004
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH39.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 2085  TEST 153        VAX MODE BRANCH ENABLE 9 -- IR<2:1>
; 2159  TEST 154        VAX MODE BRANCH ENABLE B -- IB TEST
; 2201  TEST 155        MEMORY REFERANCE CANCELS
; 2401  TEST 156        'D_MD' INHIBITED BY 'ABORT CYCLE'
; 2440  TEST 157        CES REGISTER ARITHMETIC TRAP CODES (BITS<6:4>)
; 2847  TEST 158        PSL CLEAR ON INTERRUPT AND EXCEPTION ACKNOWLEDGE
; 2923  TEST 159        PREVIOUS MODE BITS SELECTED BY 'CHK CHG MODE'
; 3002  TEST 15A        CURRENT MODE BITS AND CHECK CHANGE MODE
; 3126  TEST 15B        CURRENT MODE AND PREV MODE BITS LOAD DURING EXCEPTION ACK
; 3180  TEST 15C        PSL 'IS' BIT LOAD DURING INTERRUPT ACKNOWLEDGE
; 3238  TEST 15D        PSL TRAP PENDING (TP) BIT
; 3407  TEST 15E        PSL BITS THAT ARE A FUNCTION OF 'LOAD FPD'
; 3522  TEST 15F        VECTOR REGISTER DATA INTEGRITY BITS <31:16>
; 3660  TEST 160        SOFTWARE INTERRUPT REQUEST REGISTER
```

```
;1        .NOLIST
;1804     .LIST
;1805
```

```
                                             ;1806   .REGION/1000,13FF
                                             ;1807
                                             ;1808   ;+
                                             ;1809   ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                             ;1810   ; WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
                                             ;1811   ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                             ;1812   ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                             ;1813   ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                             ;1814   ;
                                             ;1815   ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                             ;1816   ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                             ;1817   ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                             ;1818   ;       R[OF] AND DO A RETURN0.
                                             ;1819   ;
                                             ;1820   ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                             ;1821   ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                             ;1822   ; TO THE CONSOLE.
                                             ;1823   ;
                                             ;1824   ; THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
                                             ;1825   ; ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURN0 IF THE TRAP WAS
                                             ;1826   ; EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
                                             ;1827   ; RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
                                             ;1828   ; STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.
                                             ;1829   ;-
                                             ;1830
U 1100, 0000,003C,19C0,0A78,0084,7001        ;1831   1100:   SC_K[ZERO],Q_R[OF],J/TRPH0       ; SYSTEM INIT
U 1101, 0000,003C,05C0,0A78,0084,7001        ;1832   1101:   SC_K[.1],Q_R[OF],J/TRPH0         ; DATA UNALIGNED
U 1102, 0000,003C,09C0,0A78,0084,7001        ;1833   1102:   SC_K[.2],Q_R[OF],J/TRPH0         ; X PAGE ERROR
U 1103, 0000,003C,0DC0,0A78,0084,7001        ;1834   1103:   SC_K[.3],Q_R[OF],J/TRPH0         ; TB MODIFY
U 1104, 0000,003C,11C0,0A78,0084,7001        ;1835   1104:   SC_K[.4],Q_R[OF],J/TRPH0         ; TB PROT ERROR
U 1105, 0000,003C,D5C0,0A78,0084,7001        ;1836   1105:   SC_K[.6],Q_R[OF],J/TRPH0         ; TB MISS
U 1106, 0000,003C,D9C0,0A78,0084,7001        ;1837   1106:   SC_K[.9],Q_R[OF],J/TRPH0         ; RES FLOAT OPER
U 1107, 0000,003C,5DC0,0A78,0084,7001        ;1838   1107:   SC_K[.7],Q_R[OF],J/TRPH0         ; TB PARITY
U 1108, 0000,003C,01C0,0A78,0084,7001        ;1839   1108:   SC_K[.8],Q_R[OF],J/TRPH0         ; CACHE PARITY
U 110C, 0000,003C,85C0,0A78,0084,7001        ;1840   110C:   SC_K[.C],Q_R[OF],J/TRPH0         ; RDS
U 110D, 0000,003C,89C0,0A78,0084,7001        ;1841   110D:   SC_K[.D],Q_R[OF],J/TRPH0         ; TIME OUT
U 110E, 0000,003C,65C0,0A78,0084,7001        ;1842   110E:   SC_K[.10],Q_R[OF],J/TRPH0        ; ODD ADDRESS
U 110F, 0000,003C,61C0,0A78,0084,7173        ;1843   110F:   SC_K[.F],Q_R[OF],J/TRPH2         ; CS PARITY
                                             ;1844
U 1001, 0001,2024,0180,0800,0010,104F        ;1845   TRPH0:  ALU_Q.ANDNOT.MASK,CLK.UBCC       ; WAS TRAP EXPECTED?
U 104F, 0000,013C,0180,0800,0000,1002        ;1846           Z?                               ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000        ;1847   =0      ALU_Q[AND]MASK,R[OF]_ALU,RETURN0 ; CLEAR THE BIT AND RETURN
                                             ;1848
                                             ;1849
                                             ;1850   ;+
                                             ;1851   ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                             ;1852   ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                             ;1853   ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                             ;1854   ;
                                             ;1855   ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                             ;1856   ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                             ;1857   ;             FAULT STATUS REGISTER
                                             ;1858   ;             SBI ERROR REGISTER
                                             ;1859   ;             TIMEOUT ADDRESS REGISTER
                                             ;1860   ;             MAINTENANCE REGISTER
```

```
                                          ;1861    ;              CACHE PARITY REGISTER
                                          ;1862    ;              TB ERROR REGISTER 1
                                          ;1863    ;              TB ERROR REGISTER 0
                                          ;1864    ;-
                                          ;1865
U 1003, 0018,0038,1D80,09E8,0000,1004     ;1866    TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,71A5     ;1867    =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,105B     ;1868            Q_ID[TBER0]
U 105B, 0001,203C,4DF0,2DB0,0000,105F     ;1869            RC[6]_Q,Q_ID[TBER1]
U 105F, 0001,203C,65F0,2DB8,0000,1109     ;1870            RC[7]_Q,Q_ID[SBI.ERR]
U 1109, 0001,203C,6DF0,2DD8,0000,1154     ;1871            RC[0B]_Q,Q_ID[FAULT]
U 1154, 0001,203C,75F0,2DE0,0000,1170     ;1872            RC[0C]_Q,Q_ID[MAINT]
U 1170, 0001,203C,79F0,2DC8,0000,1171     ;1873            RC[9]_Q,Q_ID[PARITY]
U 1171, 0001,203C,69F0,2DC0,0000,1172     ;1874            RC[8]_Q,Q_ID[TIME.ADDR]
U 1172, 0001,203C,81F0,2DD0,0000,1000     ;1875            RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,118A     ;1876    1000:   RC[0E]_Q,ERROR1
                                          ;1877
                                          ;1878    ;+
                                          ;1879    ; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
                                          ;1880    ;-
                                          ;1881
U 1173, 0001,2024,0180,0800,0010,1174     ;1882    TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC       ; WAS THE TRAP EXPECTED?
U 1174, 0000,013C,0180,0800,0000,1006     ;1883            Z?                               ; BRANCH IF NO
U 1006, 0001,2036,0180,0AF8,0000,0001     ;1884    =0      ALU_Q[AND]MASK,R[0F]_ALU,RETURN1 ; RETURN
U 1007, 0000,003C,0180,0800,0000,1003     ;1885            J/TRPH1                          ; REPORT UNEXPECTED TRAP
                                          ;1886
                                          ;1887
                                          ;1888    ;+
                                          ;1889    ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                          ;1890    ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                          ;1891    ;                 NEWTST
                                          ;1892    ;                 ERLOOP
                                          ;1893    ;                 ERROR1
                                          ;1894    ;                 ERROR2
                                          ;1895    ;
                                          ;1896
U 1175, 0000,003C,65F8,0800,0084,7176     ;1897    SCOPE:  SC_K[.10],Q_0                    ; SETUP TO WRITE IPL OF 1F
U 1176, 0818,0038,8D80,0800,0000,1177     ;1898            D_K[.1F]                         ; ...
U 1177, 0D00,003C,0180,0800,0000,1178     ;1899            D_DAL.SC
U 1178, 0000,003C,3D80,3C00,0000,1179     ;1900            ID[PSL]_D                        ; WRITE THE PSL
U 1179, 0818,0038,0580,0800,0000,117A     ;1901            D_K[.1]                          ; SETUP TO CLEAR THE CES REGISTER
U 117A, 0D00,003C,0180,0800,0000,117B     ;1902            D_DAL.SC
U 117B, 0F00,003C,3180,3C00,0000,117C     ;1903            ID[CES]_D,D_0                    ; CLEAR THE CES REGISTER
U 117C, 0000,003C,5D80,3C00,0000,117D     ;1904            ID[ACC.CS]_D                     ; SHUT OFF THE FLOATING POINT
U 117D, 0000,003C,3980,3C00,0000,117E     ;1905            ID[SIR]_D                        ; CLEAR THE SIR REGISTER
U 117E, 0000,003C,2980,3C00,0000,117F     ;1906            ID[CLK.CS]_D                     ; STOP INTERVAL TIMER
U 117F, 0000,003C,4980,3C00,0000,1180     ;1907            ID[TBER0]_D                      ; SHUT OFF THE TB
U 1180, 0000,003C,7180,3C00,0000,1181     ;1908            ID[COMP]_D                       ; CLEAR SILO COMPARATOR
U 1181, 0818,0038,C180,0800,0000,1182     ;1909            D_K[.FFFF]
U 1182, 0000,003C,6580,3C00,0000,1183     ;1910            ID[SBI.ERR]_D
U 1183, 0F00,003C,6D80,3C00,0000,1184     ;1911            ID[FAULT]_D,D_0
U 1184, 0000,003C,6D80,3C00,0000,1185     ;1912            ID[FAULT]_D
U 1185, 0000,003C,6580,3C00,0000,1186     ;1913            ID[SBI.ERR]_D
U 1186, 0003,003C,0180,09F0,0000,1187     ;1914            RC[0E]_0
U 1187, 0003,003C,0180,0AF8,0000,1188     ;1915            R[0F]_0
```

```
U 1188, 0003,003C,0180,09E8,0000,105E   ;1916           RC[OD]_0,J/CALLCON              ; CALL THE CONSOLE
U 1189, 0818,0038,0980,0800,0000,105E   ;1917   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 118A, 0810,0038,0180,0978,0000,118B   ;1918   ERROR1: D_RC[OF]
U 118B, 0819,0034,4D80,0800,0000,104E   ;1919           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1920   104E:   D_D.OR.K[.4],J/CALLCON
                                        ;1921
U 118C, 0810,0038,0180,0978,0000,118D   ;1922   ERROR2: D_RC[OF]
U 118D, 0819,0034,4D80,0800,0000,105A   ;1923           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1924   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1925
                                        ;1926   105E:
                                        ;1927   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1928           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1929
                                        ;1930   ;+
                                        ;1931   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1932   ;-
                                        ;1933
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1934   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1935   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1936   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1937   13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1938   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1939   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1940   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1941   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1942   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1943   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1944   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1945   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1946   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1947   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1948   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,118E   ;1949   13FF:   NOP
                                        ;1950
                                        ;1951
                                        ;1952   ;+
                                        ;1953   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
                                        ;1954   ; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
                                        ;1955   ; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
                                        ;1956   ; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
                                        ;1957   ;
                                        ;1958   ; FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
                                        ;1959   ;       THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
                                        ;1960   ;
                                        ;1961   ;               =0      D_0,CALL,J/DC5
                                        ;1962   ;                       NOP
                                        ;1963   ;               =0      CALL,J/DC5
                                        ;1964   ;-
                                        ;1965
U 118E, 0018,0038,1980,0800,0000,119E   ;1966   DC0:    ALU_0(K),J/S00
U 118F, 0018,0038,1980,0800,0000,119F   ;1967   DC1:    ALU_0(K),J/S01
U 1190, 0018,0038,1980,0800,0000,11A0   ;1968   DC2:    ALU_0(K),J/S10
U 1191, 0018,0038,1980,0800,0000,11A1   ;1969   DC3:    ALU_0(K),J/S11
U 1192, 0018,0038,0980,0800,0000,119E   ;1970   DC4:    ALU_K[.2],J/S00
```

```
U 1193, 0018,0038,0980,0800,0000,119F      DC5:    ALU_K[.2],J/S01
U 1194, 0018,0038,0980,0800,0000,11A0      DC6:    ALU_K[.2],J/S10
U 1195, 0018,0038,0980,0800,0000,11A1      DC7:    ALU_K[.2],J/S11
U 1196, 0018,0038,0580,0800,0000,119E      DC8:    ALU_K[.1],J/S00
U 1197, 0018,0038,0580,0800,0000,119F      DC9:    ALU_K[.1],J/S01
U 1198, 0018,0038,0580,0800,0000,11A0      DCA:    ALU_K[.1],J/S10
U 1199, 0018,0038,0580,0800,0000,11A1      DCB:    ALU_K[.1],J/S11
U 119A, 0018,0038,C180,0800,0000,119E      DCC:    ALU_K[.FFFF],J/S00
U 119B, 0018,0038,C180,0800,0000,119F      DCD:    ALU_K[.FFFF],J/S01
U 119C, 0018,0038,C180,0800,0000,11A0      DCE:    ALU_K[.FFFF],J/S10
U 119D, 0018,0038,C180,0800,0000,11A1      DCF:    ALU_K[.FFFF],J/S11

U 119E, 0118,0038,1B80,0800,0000,11A2      S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 119F, 0118,0038,0B80,0800,0000,11A2      S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 11A0, 0118,0038,0780,0800,0000,11A2      S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 11A1, 0118,0038,C380,0800,0000,11A2      S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX

U 11A2, 0100,003E,0380,0800,0000,0001      SX:     D_D.LEFT2,SI/7,RETURN1          ; EXIT



                                           ;+
                                           ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                           ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                           ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                           ; TYPING IT.
                                           ;-

U 11A3, 0810,0038,4D80,0978,0000,11A4      SUBTST: D_RC[OF],KMX/.FF00
U 11A4, 0019,4016,4D80,09F8,0000,0001              RC[OF]_D+K[.FF00],WORD,RETURN1


                                           ;+
                                           ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                           ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                           ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                           ;-

U 11A5, 0010,0038,01C0,0978,0000,11A6      SETRCF: Q_RC[OF]
U 11A6, 0019,2034,4DC0,0800,0000,11A7              Q_Q.AND.K[.FF00]
U 11A7, 0019,2032,1D80,09F8,0000,0001              RC[OF]_Q.OR.SC,RETURN1

```

```
                                        ;2011
                                        ;2012   SYNC00:
U 11A8, 0038,003B,41C0,0800,0000,1300   ;2013   DISPAT: Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,J/1300
U 11A9, 0000,003F,0180,0800,0000,1300   ;2014   DISPAT1:SUB/SPEC,J/1300
                                        ;2015
U 1308, 0000,003E,0180,0800,0000,0001   ;2016   1308:   RETURN1
U 133C, 0000,003E,0180,0800,0000,0001   ;2017   133C:   RETURN1
U 134F, 0000,003E,0180,0800,0000,0001   ;2018   134F:   RETURN1
U 1353, 0000,003E,0180,0800,0000,0001   ;2019   1353:   RETURN1
U 137C, 0018,003A,0DC0,0800,0000,0001   ;2020   137C:   Q_K[.3],RETURN1
U 137D, 0018,003A,05C0,0800,0000,0001   ;2021   137D:   Q_K[.1],RETURN1
U 137E, 0018,003A,09C0,0800,0000,0001   ;2022   137E:   Q_K[.2],RETURN1
U 138F, 0000,003E,01F8,0800,0000,0001   ;2023   138F:   Q_0,RETURN1
U 1390, 0000,003E,0180,0800,0000,0001   ;2024   1390:   RETURN1
U 12C4, 0000,003E,0180,0800,0000,0001   ;2025   12C4:   RETURN1
                                        ;2026
                                        ;2027   ;
                                        ;2028   ; THIS SUBROUTINE IS USED TO TEST THE IB BRANCH
                                        ;2029   ;
                                        ;2030   =000
                                        ;2031   IBBRTABLE:
U 1008, 0000,003E,01F8,0800,0000,0001   ;2032           Q_0,RETURN1
U 1009, 0018,003A,05C0,0800,0000,0001   ;2033           Q_K[.1],RETURN1
U 100A, 0018,003A,09C0,0800,0000,0001   ;2034           Q_K[.2],RETURN1
U 100B, 0018,003A,0DC0,0800,0000,0001   ;2035           Q_K[.3],RETURN1
U 100C, 0018,003A,11C0,0800,0000,0001   ;2036   REIENT: Q_K[.4],RETURN1
U 100D, 0018,0038,11C0,0800,0000,11AA   ;2037           Q_K[.4],J/ADDONE
U 100E, 0018,003A,D5C0,0800,0000,0001   ;2038           Q_K[.6],RETURN1
U 100F, 0018,003A,5DC0,0800,0000,0001   ;2039           Q_K[.7],RETURN1
U 11AA, 0019,2016,05C0,0800,0000,0001   ;2040   ADDONE: Q_Q+K[.1],RETURN1
                                        ;2041
                                        ;2042   ;+
                                        ;2043   ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
                                        ;2044   ; CACHE REFERANCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
                                        ;2045   ; IS COMPLETELY FULL OF DATA.
                                        ;2046   ;
                                        ;2047   ; BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
                                        ;2048   ;-
                                        ;2049
U 11AB, 3000,003C,0180,6000,0000,11AC   ;2050   IBWAIT: LOAD.IB,IBC/START
U 11AC, 0000,003C,0180,F800,0000,11AD   ;2051           MCT/ALLOW.IB.READ
U 11AD, 0000,003C,0180,F800,0000,11AE   ;2052           MCT/ALLOW.IB.READ
U 11AE, 0000,003C,0180,F800,0000,11AF   ;2053           MCT/ALLOW.IB.READ
U 11AF, 0000,003C,0180,F800,0000,11B0   ;2054           MCT/ALLOW.IB.READ
U 11B0, 0000,003C,0180,F800,0000,11B1   ;2055           MCT/ALLOW.IB.READ
U 11B1, 1000,003E,0180,F800,0000,0001   ;2056           MCT/ALLOW.IB.READ,IBC/STOP,RETURN1
                                        ;2057
                                        ;2058
                                        ;2059
                                        ;2060   ;+
                                        ;2061   ; THIS SUBROUTINE EXECUTE AN SBI UNJAM SEQUENCE
                                        ;2062   ;-
                                        ;2063
U 11B2, 0F00,003C,0180,0800,0000,11B3   ;2064   UNJAM:  D_0
U 11B3, 0000,003C,7580,3C00,0000,11B4   ;2065           ID[MAINT]_D                     ; RELOAD THE MAT REG
```

```
U 11B4, 0F00,003C,0180,8000,0000,11B5   ;2066           D_0,MCT/SBI.HOLD                    ; ASSERT HOLD FOR 16 CYCLES
U 11B5, 0019,0020,6180 8000,0010,11B6   ;2067   UNJAM0: A[U_D[XOR]K[.F],CLK.UBCC,MCT/SBI.HOLD ; DONE YET?
U 11B6, 0000,013C,0180,8000,0000,1010   ;2068           Z?,MCT/SBI.HOLD                     ; BRANCH IF YES
U 1010, 0819,0014,0580,8000,0000,11B5   ;2069   =0      D_D+K[.1],MCT/SBI.HOLD,J/UNJAM0 ; CONTINUE HOLDING THE BUS
                                        ;2070
U 1011, 0F00,003C,0180,8800,0000,11B7   ;2071           D_0,MCT/SBI.HOLD+UNJAM              ; ASSERT HOLD AND UNJAM FOR 16 CYCLES
U 11B7, 0019,0020,6180,8800,0010,11B8   ;2072   UNJAM1: A[U_D[XOR]K[.F],CLK.UBCC,MCT/SBI.HOLD+UNJAM ; DONE YET?
U 11B8, 0000,013C,0180,8800,0000,1012   ;2073           Z?,MCT/SBI.HOLD+UNJAM               ; BRANCH IF YES
U 1012, 0819,0014,0580,8800,0000,11B7   ;2074   =0      D_D+K[.1],MCT/SBI.HOLD+UNJAM,J/UNJAM1 ; CONTINUE UNJAM
                                        ;2075
U 1013, 0F00,003C,0180,8000,8000,11B9   ;2076           D_0,MCT/SBI.HOLD,INTRPT.ACK         ; ASSERT HOLD FOR 16 CYCLES
U 11B9, 0019,0020,6180,8000,0010,11BA   ;2077   UNJAM2: A[U_D[XOR]K[.F],MCT/SBI.HOLD,CLK.UBCC ; DONE YET?
U 11BA, 0000,013C,0180,8000,0000,1014   ;2078           Z?,MCT/SBI.HOLD                     ; BRANCH IF YES
U 1014, 0819,0014,0580,8000,0000,11B9   ;2079   =0      D_D+K[.1],MCT/SBI.HOLD,J/UNJAM2 ; CONTINUE HOLDING
                                        ;2080
U 1015, 0000,003C,8580,0800,0084,71BB   ;2081           SC_K[.C]
U 11BB, 0803,001C,0180,0800,4000,11BC   ;2082           D_NOT.MASK,INTRPT.STROBE
U 11BC, 0000,003E,7580,3C00,0000,0001   ;2083           ID[MAINT]_D,RETURN1                 ; TURN OFF THE SBI
                                        ;2084
```

```
                                         .PAGE   "TEST 153       VAX MODE BRANCH ENABLE 9 -- IR<2:1>"
                                         ;*********************************************************************
                                         ;++
                                         ; TEST  153     VAX MODE BRANCH ENABLE 9 -- IR<2:1>
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS TEST CHECKS BRANCH BITS <2:0> FOR THE IR<2:1> BRANCH. THIS IS DONE
                                         ;       BY LOADING OPCODES OF 0, 2, AND 4, EXECUTING THE BRANCH, AND
                                         ;       CHECKING THAT THE CORRECT BRANCH BITS ASSERTED.  THE BRANCH BITS
                                         ;       ARE RECEIVED BY JSR'ING TO A SUBROUTINE, WITH THE BRANCH ENABLED.
                                         ;       THE SUBROUTINE LOADS Q WITH A NUMBER THAT REPRESENTS THE CONDITION
                                         ;       OF BITS<2:0> AND RETURNS TO THE TEST CODE WHERE THE Q REGISTER IS
                                         ;       CHECKED FOR THE CORRECT NUMBER.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;       THIS TEST CHECKS THE BRANCH MULTIPLEXOR ON THE IRC AND USC
                                         ;       MODULES.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       DATA: EXPECTED BRANCH BITS <2:0>
                                         ;             RECEIVED BRANCH BITS <2:0>
                                         ;             LOOP COUNT - INDICATES WHICH OP CODE IS IN THE IB, I.E.
                                         ;               3=OPCODE 0, 2=OPCODE 2, 1=OPCODE 4
                                         ;
                                         ; SYNC POINT DESCRIPTION
                                         ;       SYNCA3--BRANCH BITS ARE STABLE
                                         ;--
                                         ;*******************************************************************
                                         =0
U 1016, 0018,0039,0D80,09F8,0000,1175    T153:   NEWTST[.3]
U 1017, 0018,0038,0D80,09E0,0000.11BD            RC[0C]_K[.3]                    ; SET THE LOOP COUNT
U 11BD, 0018,0038,3580,0A88,0000,11BE            R[1]_K[.50]                     ; SET ADDRESS OF IB DATA
U 11BE, 0018,0038,A580,0A80,0000,11BF            R[0]_K[.60]                     ; SET ADDRESS OF EXPECTED DATA

                                         ;///////////////////////////////////////////////////////////////////
                                         ;+
                                         ; START THE LOOP
                                         ;-

U 11BF, 0000,003C,0180,0A00,0200,11C0    T153L1: VA_R[0]
U 11C0, 0000,803C,0180,C800,0000,11C1            D[BYTE]_CACHE.P                 ; FETCH EXPECTED DATA
U 11C1, 0019,0034,4980,09F0,0000,1018            RC[0E]_D.AND.K[.FF]             ; SAVE
U 1018, 0000,003D,0180,0800,0000,1189    =0      ERLOOP
U 1019, 0810,0038,0180,0970,0000,101A            D_RC[0E]
U 101A, 2000,003D,0180,0A08,4200,11AB    =0      A[U_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD TEH IB
U 101B, 0000,003C,0180,0800,0000,101C            NOP
                                         =0
U 101C, 0000,093D,0180,0800,0000,1008    SYNCA3: CALL,J/IBBRTABLE,IR2-1?         ; EXECUTE THE BRANCH
U 101D, 001D,A000,0180,0800,0010,11C2            ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 11C2, 0000,013C,0180,0800,0000,101E            Z?
U 101E, 0001,203D,0180,09E8,0000,118C    =0      ERROR2,RC[0D]_Q

                                         ;+
                                         ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS TEST
                                         ;-
```

```
                                          ;2140
U 101F, 0000,003C,0180,0A00,0000,11C3     ;2141          LAB_R[0]
U 11C3, 0018,0014,0580,0A80,0000,11C4     ;2142          R[0]_LA+K[.1]                    ; INCREMENT ADR OF EXP DATA
U 11C4, 0000,003C,0180,0A08,0000,11C5     ;2143          LAB_R[1]
U 11C5, 0018,0014,0980,0A88,0000,11C6     ;2144          R[1]_LA+K[.2]                    ; INCREMENT ADR OF IB DATA
U 11C6, 0810,0038,0180,0960,0000,11C7     ;2145          D_RC[0C]
U 11C7, 0019,8000,0580,09E0,0010,11C8     ;2146          RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT THE LOOP COUNT
U 11C8, 0000,013C,0180,0800,0000,1020     ;2147          Z?
U 1020, 0000,003C,0180,0800,0000,11BF     ;2148   =0     J/T153L1                         ; CONTINUE
U 1021, 0000,003C,0180,0800,0000,1022     ;2149          NOP
                                          ;2150
                                          ;2151   ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                          ;2152   ;% 50
                                          ;2153   ;$ 0000,0002,0004
                                          ;2154   ;
                                          ;2155   ; FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                          ;2156   ;% 60
                                          ;2157   ;$ 0100,0002
                                          ;2158
                                          ;2159   .PAGE   "TEST 154       VAX MODE BRANCH ENABLE B -- IB TEST"
                                          ;2160   ;*************************************************************************
                                          ;2161   ;++
                                          ;2162   ; TEST  154     VAX MODE BRANCH ENABLE B -- IB TEST
                                          ;2163   ;
                                          ;2164   ; TEST DESCRIPTION
                                          ;2165   ;       THIS TEST CHECKS THAT BRANCH BITS 0 AND 1 BOTH ASSERT WHEN THE
                                          ;2166   ;       IB HAS VALID DATA WITH NO ERRORS DURING THE FETCH OF THE DATA.
                                          ;2167   ;
                                          ;2168   ; LOGIC DESCRIPTION
                                          ;2169   ;       THIS TEST CHECKS THE BRANCH MULTIPLEXOR AND THE LOGIC THAT FEEDS
                                          ;2170   ;       THE MUX, ON THE IRC MODULE, FOR BRANCH ENABLE B.
                                          ;2171   ;
                                          ;2172   ; ERROR DESCRIPTION
                                          ;2173   ;       DATA: EXPECTED BRANCH BITS <1:0>
                                          ;2174   ;             RECEIVED BRANCH BITS <1:0>
                                          ;2175   ;
                                          ;2176   ; SYNC POINT DESCRIPTION
                                          ;2177   ;       ADDRESS SYNCA4--BRANCH BITS ARE ACTIVE
                                          ;2178   ;--
                                          ;2179   ;*************************************************************************
                                          ;2180   =0
U 1022, 0018,0039,0980,09F8,0000,1175     ;2181   T154:   NEWTST[.2]
U 1023, 0018,0038,0D80,09F0,0000,11C9     ;2182           RC[OE]_K[.3]                    ; SET THE EXPECTED DATA
U 11C9, 0003,003C,0180,0A88,0000,1024     ;2183           R[1]_0                          ; SET ADDRESS OF IB DATA
                                          ;2184
                                          ;2185   ;///////////////////////////////////////////////////////////////////////
                                          ;2186   ;+
                                          ;2187   ; START THE TEST
                                          ;2188   ;-
                                          ;2189
                                          ;2190   =0
U 1024, 2000,003D,0180,0A08,4200,11AB     ;2191   T154S1: ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1025, 0000,003C,0180,0800,0000,1026     ;2192           NOP
                                          ;2193   =0
U 1026, 0000,0B3D,0180,0800,0000,1008     ;2194   SYNCA4: CALL,J/IBBRTABLE,IB.TEST?       ; EXECUTE THE BRANCH
U 1027, 0810,0038,0180,0970,0000,11CA     ;2195           D_RC[OE]                        ; GET EXPECTED DATA
U 11CA, 001D,2000,0180,0800,0010,11CB     ;2196           ALU_Q-D,CLK.UBCC                ; CHECK RESULT OF BRANCH
U 11CB, 0000,013C,0180,0800,0000,1028     ;2197           Z?
U 1028, 0001,203D,0180,09E8,0000,118C     ;2198   =0      ERROR2,RC[OD]_Q                 ; BRANCH BITS INCORRECT
U 1029, 0000,003C,0180,0800,0000,102A     ;2199           NOP
                                          ;2200
```

```
                                            .PAGE   "TEST 155       MEMORY REFERANCE CANCELS"
                                            ;*************************************************************************
                                            ;++
                                            ;
                                            ; TEST  155     MEMORY REFERANCE CANCELS
                                            ;
                                            ; TEST DESCRIPTION
                                            ;
                                            ;       THIS TEST CHECKS PART OF THE LOGIC THAT CANCELS MEMORY REFERANCES
                                            ;       DUE TO ERROR CONDITIONS. THE OTHER CONDITIONS THAT CAUSE CANCEL
                                            ;       ARE CHECKED LATER.
                                            ;
                                            ;       SUBTEST 1 - CHECK THAT A BAD IPA INHIBITS THE IB FROM GETTING
                                            ;                   DATA FROM THE CACHE.
                                            ;
                                            ;       SUBTEST 2 - CHECK THAT A TB MISS ON A READ.V.NEWPC INHIBITS THE
                                            ;                   IB FROM GETTING DATA.
                                            ;
                                            ;       SUBTEST 3 - CHECK THAT A TB PROTECTICN FAILURE DURING A READ.V.NEWPC
                                            ;                   INHIBITS THE IB FROM GETTING DATA.
                                            ;
                                            ;       SUBTEST 4 - CHECK THAT A TB PARITY ERROR DURING A READ.V.NEWPC
                                            ;                   INHIBITS THE IB FROM GETTING DATA.
                                            ;
                                            ;       SUBTEST 5 - CHECK THAT AN ODD ADDRESS TRAP IN COMPATABILITY MODE
                                            ;                   INHIBITS THE PARITY REGISTER FROM BEING CLOCKED.
                                            ;
                                            ; LOGIC DESCRIPTION
                                            ;
                                            ;       THIS TEST CHECKS THE LOGIC ON THE TBM MODULE THAT GENERATES THE
                                            ;       CANCEL SIGNAL.
                                            ;
                                            ; ERROR DESCRIPTION
                                            ;
                                            ;       SUBTESTS 1, 2, 3, AND 4
                                            ;               DATA: EXPECTED CALL3 CODE
                                            ;                     RECEIVED CALL3 CODE
                                            ;       SUBTEST 5
                                            ;               DATA: EXPECTED DATA IN D REGISTER
                                            ;                     RECEIVED DATA IN D REGISTER
                                            ;
                                            ;       NOTE: THE CALL3 CODE REPRESENTS THE ADDRESS THAT WAS SELECTED
                                            ;             DURING THE CALL3. 0=8F (GOOD DATA), 1=7D (IB ERROR), AND
                                            ;             2=7E (IB STALL BUT NO ERROR), 3=7C (TB MISS)
                                            ;--
                                            ;*************************************************************************
                                            ;
                                            =0
U 102A, 0018,0039,0980,09F8,0000,1175       T008:   NEWTST[.2]
U 102B, 0000,003C,0180,0800,0000,102C               NOP

                                            ;/////////////////////////////////////////////////////////////////////////
                                            ;+
                                            ; CHECK THAT THE IB DOES NOT GET DATA IF THE IPA IS BAD.
                                            ;-
```

```
                                        ;2256
                                        ;2257   =0
U 102C, 0000,003D,0180,0800,0000,11A3   ;2258   S1:     SUBTEST
U 102D, 0018,0038,0980,09F0,0000,102E   ;2259           RC[OE]_K[.2]                    ; SET THE EXPECTED CALL 3 CODE
U 102E, 0000,003D,0180,0800,0000,1189   ;2260   =0      ERLOOP
U 102F, 2003,003C,0180,0800,4200,11CC   ;2261           ALU_O(A),FLUSH.IB               ; SHOULD SET THE BAD IPA SIGNAL
U 11CC, 3000,003C,0180,F800,0000,11CD   ;2262           IBC7START,MCT/ALLOW.IB.READ     ; START THE IB
U 11CD, 0000,003C,0180,F800,0000,11CE   ;2263           MCT/ALLOW.IB.READ               ; WAIT AND SEE IF IB GETS DATA
U 11CE, 0000,003C,0180,F800,0000,11CF   ;2264           MCT/ALLOW.IB.READ
U 11CF, 0000,003C,0180,F800,0000,11D0   ;2265           MCT/ALLOW.IB.READ
U 11D0, 0000,003C,0180,F800,0000,11D1   ;2266           MCT/ALLOW.IB.READ
U 11D1, 0000,003C,0180,F800,0000,11D2   ;2267           MCT/ALLOW.IB.READ
U 11D2, 0000,003C,0180,F800,0000,11D3   ;2268           MCT/ALLOW.IB.READ
U 11D3, 1818,0038,0980,0800,0000,1030   ;2269           IBC/STOP,D_K[.2]                ; STOP THE IB
U 1030, 0000,003D,0180,0800,0000,11A9   ;2270   =0      CALL,J/DISPAT1                  ; EXECUTE THE CALL 3
U 1031, 001D,2000,0180,0800,0010,11D4   ;2271           ALU_Q-D,CLK.UBCC                ; CEHCK THE CALL3 CODE
U 11D4, 0000,013C,0180,0800,0000,1032   ;2272           Z?
U 1032, 0001,203D,0180,09E8,0000,118C   ;2273   =0      ERROR2,RC[OD]_Q                 ; DID NOT GO TO ADDRESS 7E
U 1033, 0000,003C,0180,0800,0000,1034   ;2274           NOP
                                        ;2275
                                        ;2276
                                        ;2277   ;////////////////////////////////////////////////////////////////////////
                                        ;2278   ;+
                                        ;2279   ; CHECK THAT THE IB DOES NOT GET ANY DATA IF THE TB IS NOT VALID
                                        ;2280   ;-
                                        ;2281
                                        ;2282   =0
U 1034, 0000,003D,0180,0800,0000,11A3   ;2283   S2:     SUBTEST
U 1035, 0018,0038,0D80,09F0,0000,11D5   ;2284           RC[OE]_K[.3]                    ; SET THE EXPECTED DATA
U 11D5, 0000,003C,2180,0800,0084,71D6   ;2285           SC_K[.T4]                       ; GENERATE DATA FOR TBERO
U 11D6, 0803,001C,0180,0800,0000,11D7   ;2286           D_NOT.MASK
U 11D7, 0819,0030,0580,0800,0000,11D8   ;2287           D_D.OR.K[.1]
U 11D8, 0000,003C,4980,3C00,0000,11D9   ;2288           ID[TBERO]_D                     ; TURN THE TB ON
U 11D9, 0003,003C,0180,0800,0200,11DA   ;2289           VA_ALU,ALU_O(A)                 ; LOAD THE VA
U 11DA, 0818,0038,CD80,0800,0000,11DB   ;2290           D_R[.F0]                        ; GENERATE A PTE WITH THE VALID
U 11DB, 0819,0024,4180,0800,0000,11DC   ;2291           D_D.ANDNOT.K[.80]               ; BIT CLEAR
U 11DC, 0819,0030,0180,0800,0000,11DD   ;2292           D_D.OR.K[.8]                    ; ...
U 11DD, 0800,003C,0180,0800,0000,11DE   ;2293           D_D.SWAP
U 11DE, 0000,003C,4180,3C00,0000,1036   ;2294           ID[TBUF]_D                      ; LOAD THE TB
U 1036, 0000,003D,0180,0800,0000,1189   ;2295   =0      ERLOOP
U 1037, 0000,003C,0180,0800,0000,1038   ;2296           NOP
U 1038, 2003,003D,0180,0800,4200,11AB   ;2297   =0      ALU_O(A),FLUSH.IB,CALL,J/IBWAIT ; GO START THE IB
U 1039, 0810,0038,0180,0970,0000,103A   ;2298           D_RC[OE]                        ; GET THE EXPECTED CALL3 CODE
U 103A, 0000,003D,0180,0800,0000,11A9   ;2299   =0      CALL,J/DISPAT1                  ; GO EXECUTE THE CALL3
U 103B, 001D,2000,0180,0800,0010,11DF   ;2300           ALU_Q-D,CLK.UBCC                ; OK?
U 11DF, 0000,013C,0180,0800,0000,103C   ;2301           Z?
U 103C, 0001,203D,0180,09E8,0000,118C   ;2302   =0      ERROR2,RC[OD]_Q                 ; DID NOT GO TO ADDRESS 7E
U 103D, 0000,003C,0180,0800,0000,103E   ;2303           NOP
                                        ;2304
                                        ;2305
                                        ;2306   ;//////////////////////////////////////////////////////////////////////////
                                        ;2307   ;+
                                        ;2308   ; CHECK THAT THE IB DOES NOT GET ANY DATA IF THE PROTECTION IS BAD
                                        ;2309   ;-
                                        ;2310
```

```
                                              ;2311    =0
U 103E, 0000,003D,0180,0800,0000,11A3         ;2312    S3:     SUBTEST
U 103F, 0018,0038,0580,09F0,0000,11E0         ;2313            RC[0E]_K[.1]                       ; SET THE EXPECTED CALL3 CODE
U 11E0, 0000,003C,8D80,0800,0084,71E1         ;2314            SC_K[.TF]                          ; GENERATE DATA TO CAUSE BAD
U 11E1, 0803,001C,0180,0800,0000,11E2         ;2315            D_NOT.MASK                         ; PROTECTION
U 11E2, 0003,003C,0180,0800,0200,11E3         ;2316            VA_ALU,ALU_0(A)                    ; LOAD THE VA
U 11E3, 0000,003C,4180,3C00,0000,1040         ;2317            ID[TBUF]_D                         ; LOAD THE TB
U 1040, 0000,003D,0180,0800,0000,1189         ;2318    =0      ERLOOP
U 1041, 0000,003C,0180,0800,0000,1042         ;2319            NOP
U 1042, 2003,003D,0180,0800,4200,11AB         ;2320    =0      ALU_0(A),FLUSH.IB,CALL,J/IBWAIT ; START THE IB
U 1043, 0810,0038,0180,0970,0000,1044         ;2321            D_RC[0E]                           ; GET THE EXPECTED CALL3 CODE
U 1044, 0000,003D,0180,0800,0000,11A9         ;2322    =0      CALL,J/DISPAT1                     ; GO EXECUTE THE CALL3
U 1045, 001D,2000,0180,0800,0010,11E4         ;2323            ALU_Q-D,CLK.UBCC                   ; OK?
U 11E4, 0000,013C,0180,0800,0000,1046         ;2324            Z?
U 1046, 0001,203D,0180,09E8,0000,118C         ;2325    =0      ERROR2,RC[0D]_Q                    ; DID NOT GO TO ADDRESS 7D
U 1047, 0000,003C,0180,0800,0000,1048         ;2326            NOP
                                              ;2327
                                              ;2328
                                              ;2329    ;/////////////////////////////////////////'/////'//////////////////////
                                              ;2330    ;+
                                              ;2331    ; CHECK THAT THE IB DOES NOT GET ANY DATA WITH A TB PARITY ERROR
                                              ;2332    ;-
                                              ;2333
                                              ;2334    =0
U 1048, 0000,003D,0180,0800,0000,11A3         ;2335    S4:     SUBTEST
U 1049, 0018,0038,0580,09F0,0000,11E5         ;2336            RC[0E]_K[.1]                       ; SET THE EXPECTED CALL3 CODE
U 11E5, 0818,0038,CD80,0800,0000,11E6         ;2337            D_K[.F0]                           ; GENERATE DATA TO LOAD TB
U 11E6, 0819,0030,0180,0800,0000,11E7         ;2338            D_D.OR.K[.8]
U 11E7, 0800,003C,0180,0800,0000,11E8         ;2339            D_D.SWAP
U 11E8, 0003,003C,0180,0800,0200,11E9         ;2340            VA_ALU,ALU_0(A)
U 11E9, 0000,003C,4180,3C00,0000,11EA         ;2341            ID[TBUF]_D                         ; LOAD THE TB
U 11EA, 0000,003C,49F0,2C00,0000,11EB         ;2342            Q_ID[TBER0]                        ; FORCE PARITY ERROR IN GROUP 0
U 11EB, 0819,2030,1180,0800,0000,11EC         ;2343            D_Q.OR.K[.4]                       ; DATA 0
U 11EC, 0000,003C,4980,3C00,0000,104A         ;2344            ID[TBER0]_D
U 104A, 0000,003D,0180,0800,0000,1189         ;2345    =0      ERLOOP
U 104B, 0000,003C,0180,0800,0000,104C         ;2346            NOP
U 104C, 2003,003D,0180,0800,4200,11AB         ;2347    =0      ALU_0(A),FLUSH.IB,CALL,J/IBWAIT ; START THE IB
U 104D, 0810,0038,0180,0970,0000,1050         ;2348            D_RC[0E]                           ; GET EXPECTED DATA
U 1050, 0000,003D,0180,0800,0000,11A9         ;2349    =0      CALL,J/DISPAT1                     ; GO EXECUTE THE CALL 3
U 1051, 001D,2000,0180,0800,0010,11ED         ;2350            ALU_Q-D,CLK.UBCC                   ; OK?
U 11ED, 0000,013C,0180,0800,0000,1052         ;2351            Z?
U 1052, 0001,203D,0180,09E8,0000,118C         ;2352    =0      ERROR2,RC[0D]_Q                    ; ADDRESS WAS NOT 7D
U 1053, 0F00,003C,0180,0800,0000,11EE         ;2353            D_0                                ; CLEAR FORCE PARITY BITS
U 11EE, 0000,003C,4980,3C00,0000,11EF         ;2354            ID[TBER0]_D
U 11EF, 0000,003C,4D80,3C00,0000,11F0         ;2355            ID[TBER1]_D                        ; CLEAR TRAP BIT
U 11F0, 0000,003C,0180,6000,0000,1054         ;2356            LOAD.IB                            ; CLEAR IB ERROR BITS IN TBER1
                                              ;2357
                                              ;2358
                                              ;2359    ;//////////////////////////////////////////////////////////////////////////
                                              ;2360    ;+
                                              ;2361    ; CHECK THAT THE PARITY REGISTER DOES NOT GET LOADED (BECAUSE OF
                                              ;2362    ; CANCEL) DURING AN ODD ADDRESS TRAP AND CACHE PARITY ERROR.
                                              ;2363    ;-
                                              ;2364
                                              ;2365    =0
```

```
U 1054, 0000,003D,0180,0800,0000,11A3   ;2366   S5:     SUBTEST
U 1055, 0818,0038,4580,0800,0000,11F1   ;2367           D_K[.8000]                      ; SET UP THE EXPECTED DATA
U 11F1, 0600,003C,0180,0800,0000,11F2   ;2368           D_D.RIGHT
U 11F2, 0001,003C,0180,09F0,0000,11F3   ;2369           RC[0E]_D                        ; EQUALS 4000
U 11F3, 0818,0038,0580,0800,0000,11F4   ;2370           D_K[.1]                         ; SETUP TO WRITE TEST DATA
U 11F4, 0018,0038,4180,0800,0200,11F5   ;2371           VA_ALU,ALU_K[.80]               ; LOAD THE VA
U 11F5, 0000,003C,0180,9800,0000,1056   ;2372           MCT/VALIDATE                    ; WRITE THE TEST DATA
U 1056, 0000,003D,0180,0800,0000,1189   ;2373   =0      ERLOOP
U 1057, 0000,003C,8D80,1C00,0084,71F6   ;2374           SC_K[.1F],CID/CONT              ; SET CM MODE
                                        ;2375                                           ; AND CLEAR CONSOLE COMMAND MODE
U 11F6, 0803,001C,3DF0,2C00,0000,11F7   ;2376           Q_ID[PSL],D_NOT.MASK
U 11F7, 081D,0030,0180,0800,0000,11F8   ;2377           D_D.OR.Q
U 11F8, 0000,003C,3D80,3C00,0000,11F9   ;2378           ID[PSL]_D                       ; SET CM MODE
U 11F9, 0818,0038,5180,0800,0000,11FA   ;2379           D_K[.1E]                        ; GENERATE DATA TO FORCE THE CACHE
U 11FA, 0000,003C,65F8,0800,0084,71FB   ;2380           SC_K[.10],Q_0                   ; PARITY ERROR
U 11FB, 0D00,003C,75F0,2C00,0000,11FC   ;2381           D_DAL.SC,Q_ID[MAINT]
U 11FC, 081D,0030,0180,0800,0000,11FD   ;2382           D_D.OR.Q
U 11FD, 0000,003C,7580,3C00,0000,11FE   ;2383           ID[MAINT]_D                     ; LOAD THE MAINT REG
U 11FE, 0803,001C,0180,0800,0084,71FF   ;2384           D_NOT.MASK,SC_K[.8]             ; SET THE TRAP FLAG
U 11FF, 0001,001C,0180,0AF8,0000,1200   ;2385           R[0F]_D.ORNOT.MASK
U 1200, 0818,0038,4580,0800,0000,1201   ;2386           D_K[.8000]                      ; CLEAR THE PARITY REGISTER
U 1201, 0000,003C,7980,3C00,0000,1202   ;2387           ID[PARITY]_D                    ; ...
U 1202, 0818,0038,4180,0800,0000,1203   ;2388           D_K[.80]
U 1203, 0019,0014,0580,0800,0200,1204   ;2389           VA_ALU,ALU_D+K[.1]              ; LOAD THE VA
U 1204, 0000,403C,0180,4000,0C00,1205   ;2390           MCT/READ.V.RCHK,MSC/CHK.ODD.ADDR,WORD
U 1205, 0818,0038,4580,0800,0000,1206   ;2391           D_K[.8000]
U 1206, 0200,003C,0180,0800,0000,1207   ;2392           D_D.RIGHT2                      ; SETUP TO CLEAR FORCE PARITY
U 1207, 0600,003C,0180,0800,0000,1208   ;2393           D_D.RIGHT                       ; D CONTAINS 1000(X)
U 1208, 0000,003C,7580,3C00,0000,1209   ;2394           ID[MAINT]_D                     ; LOAD THE MAINT REG
U 1209, 0810,0038,79F0,2D70,0000,120A   ;2395           Q_ID[PARITY],D_RC[0E]           ; CHECK THAT PARITY REGISTER DID NOT
U 120A, 001D,2000,0180,0800,0010,120B   ;2396           ALU_Q-D,CLK.UBCC                ; GET LOADED.
U 120B, 0000,013C,0180,0800,0000,1058   ;2397           Z?
U 1058, 0001,203D,0180,09E8,0000,118C   ;2398   =0      ERROR2,RC[0D]_Q                 ; ODD ADDRESS DID NOT CAUSE CANCEL
U 1059, 0000,003C,0180,0800,0000,105C   ;2399           NOP
                                        ;2400
```

```
                                                .PAGE   "TEST 156       'D_MD' INHIBITED BY 'ABORT CYCLE'"
                                                ;**********************************************************************
                                                ;++
                                                ;
                                                ; TEST  156      'D_MD' INHIBITED BY 'ABORT CYCLE'
                                                ;
                                                ; TEST DESCRIPTION
                                                ;
                                                ;       THIS TEST CHECKS THAT THE D REGISTER DOES NOT GET LOADED WITH
                                                ;       THE DATA ON THE MD BUS DURING A READ IF 'ABORT CYCLE' IS ALSO
                                                ;       ASCERTED. ABORT CYCLE IS ASCERTED BY DOING THE READ ON THE
                                                ;       ECO'D ADDRESS.
                                                ;
                                                ; LOGIC DESCRIPTION
                                                ;
                                                ;       THIS TEST CHECKS THE GATE, ON THE SBL MODULE, THAT INHIBITS THE SIGNAL
                                                ;       'MD TO D' IF THE SIGNAL 'ABORT CYCLE' IS ASCERTED.
                                                ;
                                                ; ERROR DESCRIPTION
                                                ;
                                                ;       DATA: EXPECTED CONTENTS OF THE D REGISTER
                                                ;             RECEIVED CONTENTS OF THE D REGISTER
                                                ;--
                                                ;**********************************************************************

                                                =0
U 105C, 0018,0039,0980,09F8,0000,1175           T156:   NEWTST[.2]
U 105D, 0003,003C,0180,09F0,0000,120C                   RC[0E]_0                        ; SET THE EXPECTED DATA
U 120C, 0818,0038,C180,0800,0000,120D                   D_K[.FFFF]                      ; WRITE DATA PATTERN INTO
U 120D, 0018,0038,4180,0800,0200,120E                   VA_ALU,ALU_K[.80]               ; THE CACHE
U 120E, 0000,003C,0180,9800,0000,1060                   MCT/VALIDATE                    ; ...
U 1060, 0000,003D,0180,0800,0000,1189           =0      ERLOOP
U 1061, 0F18,0038,4180,0800,0200,12AA                   VA_ALU,ALU_K[.80],D_0           ; LOAD THE ADDRESS
U 12AA, 0000,003C,0180,C800,0000,1155           12AA:   D[LONG]_CACHE.P                 ; THIS ADDRESS IS ECO'D TO '1155'
U 1155, 0001,003C,0180,0800,0010,120F           1155:   ALU_D,C[K.UBCC                  ; CHECK THAT THE READ WAS ABORTED
U 120F, 0000,013C,0180,0800,0000,1062                   Z?
U 1062, 0001,003D,0180,09E8,0000,118C           =0      ERROR2,RC[0D]_D                 ; D REGISTER WAS LOADED
U 1063, 0000,003C,0180,0800,0000,1064                   NOP
```

```
.PAGE   "TEST 157       CES REGISTER ARITHMETIC TRAP CODES (BITS<6:4>)"
;******************************************************************************
;++
; TEST  157     CES REGISTER ARITHMETIC TRAP CODES (BITS<6:4>)
;
; TEST DESCRIPTION
;       THIS TEST CHECKS THE THREE BITS IN THE CES REGISTER THAT REPRESENT
;       THE ARITHMETIC TRAP CODES. SINCE TRAP CODE 0 IS A FUNCTION OF  THE V DATA
;       SIGNALS, THE INSTRUCTION BUFFER MUST BE LOADED WITH SPECIFIC OP CODES TO
;       GENERATE THE REQUIRED CONDITIONS OF THE V DATA SIGNALS.
;
;       SUBTST 1 - CHECK THAT THE BITS SET AND CLEAR CORRECTLY WHEN WRITTEN
;                  FROM THE ID BUS. ONLY 5 OF THE 8 POSSIBLE BIT PATTERNS
;                  ARE TESTED IN THIS SUBTEST. THESE 5 PATTERNS SET OR CLEAR
;                  THE TRAP CODES INDEPENDENTLY OF OTHER SIGNALS EXCEPT FOR THE
;                  PSL IV BIT, WHICH IS SET FOR THIS SUBTEST.
;       SUBTST 2 - CHECK THAT THE BITS SET WHEN ALL ONE'S ARE WRITTEN TO THEM.
;       SUBTST 3 - CHECK THAT TRAP CODE 0 DOES NOT SET WHEN THE CONDITION
;                  CODE LOAD IS NOT = 7.
;       SUBTST 4 - CHECK THAT TRAP CODE 0 DOES NOT SET WHEN THE PSL IV
;                  BIT IS CLEAR.
;       SUBTST 5 - CHECK THAT TRAP CODE 0 DOES NOT SET WHEN "ID TO TRAP
;                  CODE" IS TRUE.
;       SUBTST 6 - CHECK THAT TRAP CODE 0 DOES NOT SET WHEN GATES E50.8
;                  AND E51.8 ARE NOT ASSERTED.
;       SUBTST 7 - CHECK THAT TRAP CODE 0 DOES NOT SET WHEN 'EN IV TRAP"
;                  IS NOT ASSERTED.
;       SUBTST 8 - CHECK THAT TRAP CODE 0 SETS WHEN GATE E50.8 IS ASSERTED.
;       SUBTST 9 - CHECK THAT TRAP CODE 0 SETS WHEN GATE E51.8 IS ASSERTED.
;       SUBTST A - CHECK THAT TRAP CODE 0 SETS WHEN GATE E50.8 IS ASSERTED.
;       SUBTST B - CHECK THAT "ID TO TRAP CODE" IS FALSE WHEN THE PSL IV
;                  IS CLEAR AND ID BUS <6:4> IS = 1
;       SUBTST C - CHECK THAT "ID TO TRAP CODE" IS FALSE WHEN THE PSL DV
;                  BIT IS CLEAR AND ID BUS <6:4> IS  = 6
;       SUBTST D - CHECK THAT "ID TO TRAP CODE" IS TRUE WHEN THE PSL FU
;                  BIT IS SET AND ID BUS <6:4> IS = 5
;
; LOGIC DESCRIPTION
;       THIS TEST CHECKS THE LOGIC ON THE CEH MODULE THAT CONTROLS THE
;       SETTING AND CLEARING OF THE ARITHMETIC TRAP CODES.
;
; ERROR DESCRIPTION
;       DATA: EXPECTED ARITHMETIC TRAP CODE
;             RECEIVED ARITHMETIC TRAP CODE
;             LOOP COUNT FOR SUBTEST 1 ONLY -- INDICATES WHICH VALUE
;               OF ID BUS BITS<6:4> IS BEING USED, I.E.
;                 4= 1, 3= 2, 2= 3, AND 1= 4
;
; SYNC POINT DESCRIPTION
;       SUBTST 1 - SYNC06--LOAD THE TRAP CODES
;                  SYNC07--READ THE TRAP CODES
;                  SYNC08--CLEAR THE TRAP CODES WITH ID BUS BITS<6:4>=0
;       SUBTST 2 - SYNC09--SET THE TRAP CODES
;                  SYNC0A--READ THE TRAP CODES
;       SUBTST 3 - SYNC0B--CLOCK TRAP CODE 0
```

```
                                             ;2495   ;       SUBTST 4 - SYNC0C--CLOCK TRAP CODE 0
                                             ;2496   ;       SUBTST 5 - SYNC0D--CLOCK TRAP CODE 0
                                             ;2497   ;       SUBTST 6 - SYNC0E--CLOCK TRAP CODE 0
                                             ;2498   ;       SUBTST 7 - SYNC0F--CLOCK TRAP CODE 0
                                             ;2499   ;       SUBTST 8 - SYNC10--SET TRAP CODE 0
                                             ;2500   ;       SUBTST 9 - SYNC11--SET TRAP CODE 0
                                             ;2501   ;       SUBTST A - SYNC12--SET TRAP CODE 0
                                             ;2502   ;       SUBTST B - SYNC13--''ID TO TRAP CODE'' SHOULD BE FALSE
                                             ;2503   ;       SUBTST C - SYNC14--''ID TO TRAP CODE'' SHOULD BE FALSE
                                             ;2504   ;       SUBTST D - SYNC15--''ID TO TRAP CODE'' SHOULD BE TRUE
                                             ;2505   ;--
                                             ;2506   ;*************************************************************************
                                             ;2507   =0
U 1064, 0000,003D,0180,0800,0000,1175        ;2508   T157:   NEWTST
U 1065, 0018,0038,0D80,09F8,0000,1066        ;2509           RC[0F]_K[.3]                    ; THREE ARGS FOR TYPEOUT
U 1066, 0818,0039,5D80,0800,0000,118E        ;2510   =0      D_K[.7],CALL,J/DC0              ; GENERATE MASK FOR TRAP CODE
U 1067, 0001,003C,0180,0A80,0000,1068        ;2511           R[0]_D                          ; SAVE
                                             ;2512
                                             ;2513   ;/////////////////////////////////////////'////'////////////////////////
                                             ;2514
                                             ;2515   ;+
                                             ;2516   ; FIRST CHECK THOSE FUNCTIONS THAT ARE ONLY A FUNCTION OF THE ID BUS DATA
                                             ;2517   ; ID BUS<6:4>=LLH,LHL,LHH,HLL, AND LLL
                                             ;2518   ;-
                                             ;2519
                                             ;2520   =0
U 1068, 0000,003D,0180,0800,0000,11A3        ;2521   T157S1: SUBTEST
U 1069, 0018,0038,6580,09F0,0000,1210        ;2522           RC[0E]_K[.10]                   ; INIT THE EXPECTED DATA
U 1210, 0018,0038,1180,09E0,0000,1211        ;2523           RC[0C]_K[.4]                    ; SET THE LOOP COUNT
U 1211, 0818,0038,7580,0800,0000,1212        ;2524           D_K[.20]                        ; GET DATA TO INIT THE PSL
U 1212, 0000,003C,3D80,3C00,0000,106A        ;2525           ID[PSL]_D                       ; SET THE IV BIT IN THE PSL
                                             ;2526   =0
U 106A, 0000,003D,0180,0800,0000,1189        ;2527   T157L1: ERLOOP
U 106B, 0810,0038,0180,0970,0000,1213        ;2528           D_RC[0E]                        ; GET THE EXPECTED DATA
U 1213, 0000,003C,3180,3C00,0000,1214        ;2529   SYNC06: ID[CES]_D                       ; EXECUTE THE LOAD OF THE TRAP CODES
U 1214, 0000,003C,31F0,2C00,0000,1215        ;2530   SYNC07: Q_ID[CES]                       ; READ THEM BACK
U 1215, 001C,0034,01C0,0A00,0000,1216        ;2531           Q_Q.AND.R[0]                    ; MASK
U 1216, 001D,2000,0180,0800,0010,1217        ;2532           A[U_Q-D,CLK.UBCC                ; CHECK
U 1217, 0000,013C,0180,0800,0000,106C        ;2533           Z?
U 106C, 0001,203D,0180,09E8,0000,118C        ;2534   =0      ERROR2,RC[0D]_Q                 ; TRAP CODES FAILED
U 106D, 0000,003C,0180,0800,0000,106E        ;2535           NOP
U 106E, 0000,003D,0180,0800,0000,1189        ;2536   =0      ERLOOP
U 106F, 0810,0038,0180,0970,0000,1218        ;2537           D_RC[0E]
U 1218, 0F00,003C,3180,3C00,0000,1219        ;2538           ID[CES]_D,D_0                   ; SET THE TRAP CODE BITS
U 1219, 0000,003C,3180,3C00,0000,121A        ;2539   SYNC08: ID[CES]_D                       ; SEE IF THEY CLEAR
U 121A, 0000,003C,31F0,2C00,0000,121B        ;2540           Q_ID[CES]                       ; READ THEM
U 121B, 001C,0034,01C0,0A00,0000,121C        ;2541           Q_Q.AND.R[0]                    ; MASK
U 121C, 001D,2000,0180,0800,0010,121D        ;2542           A[U_Q-D,CLK.UBCC                ; CHECK
U 121D, 0000,013C,0180,0800,0000,1070        ;2543           Z?
U 1070, 0001,203D,0180,09E8,0000,118C        ;2544   =0      ERROR2,RC[0D]_Q                 ; TRAP CODE BITS DID NOT CLEAR
                                             ;2545
                                             ;2546   ;+
                                             ;2547   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                             ;2548   ;-
                                             ;2549
```

```
U 1071, 0810,0038,6580,0970,0000,121E   ;2550          D_RC[0E],KMX/.10                 ; GET EXPECTED DATA
U 121E, 0F19,0014,6580,09F0,0000,121F   ;2551          RC[0E]_D+K[.10],D_0              ; SELECT NEXT PATTERN
U 121F, 0000,003C,3D80,3C00,0000,1220   ;2552          ID[PSL]_D                        ; CLEAR THE IV BIT IN THE PSL
U 1220, 0810,0038,0180,0960,0000,1221   ;2553          D_RC[0C]
U 1221, 0019,8000,0580,09E0,0010,1222   ;2554          RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; CHECK THE LOOP COUNT
U 1222, 0000,013C,0180,0800,0000,1072   ;2555          Z?
U 1072, 0000,003C,0180,0800,0000,106A   ;2556  =0      J/T157L1                         ; CONTINUE
                                        ;2557
                                        ;2558
                                        ;2559  ;//////////////////////////////////////////////////////////////////////
                                        ;2560
                                        ;2561  ;+
                                        ;2562  ; NOW CHECK ID BUS<6:4>=HHH
                                        ;2563  ;-
                                        ;2564
U 1073, 0000,003C,0180,0800,0000,1074   ;2565  T157S2: NOP
U 1074, 0000,003D,0980,0800,0084,71A5   ;2566  =0      SETRCF[.2]
U 1075, 0000,003C,0180,0800,0000,1076   ;2567          NOP
U 1076, 0000,003D,0180,0800,0000,11A3   ;2568  =0      SUBTEST
U 1077, 0000,003C,0180,0A00,0000,1223   ;2569          LAB_R[0]
U 1223, 0000,003C,0180,09F0,0000,1078   ;2570          RC[0E]_LA                        ; SET THE EXPECTED DATA
U 1078, 0000,003D,0180,0800,0000,1189   ;2571  =0      ERLOOP
U 1079, 0810,0038,0180,0970,0000,1224   ;2572          D_RC[0E]
U 1224, 0000,003C,3180,3C00,0000,1225   ;2573  SYNC09: ID[CES]_D                        ; EXECUTE THE TEST
U 1225, 0000,003C,31F0,2C00,0000,1226   ;2574  SYNC0A: Q_ID[CES]                        ; READ THE TRAP CODES BACK
U 1226, 001C,0034,01C0,0A00,0000,1227   ;2575          Q_Q.AND.R[0]                     ; MASK
U 1227, 001D,2000,0180,0800,0010,1228   ;2576          ALU_Q-D,CLK.UBCC                 ; CHECK
U 1228, 0000,013C,0180,0800,0000,107A   ;2577          Z?
U 107A, 0001,203D,0180,09E8,0000,118C   ;2578  =0      ERROR2,RC[0D]_Q                  ; TRAP CODES DID NOT SET
                                        ;2579
                                        ;2580
                                        ;2581  ;//////////////////////////////////////////////////////////////////////
                                        ;2582
                                        ;2583  ;+
                                        ;2584  ; CHECK TRAP CODE 0 FALSE=> ID BUS<6:4>=HLH*-PSL FU*-CCL7
                                        ;2585  ;-
                                        ;2586
U 107B, 0003,003C,0180,0A88,0000,107C   ;2587  T157S3: R[1]_0                           ; INIT ADDRESS OF IB DATA
U 107C, 0000,003D,0180,0800,0000,11A3   ;2588  =0      SUBTEST
U 107D, 0003,003C,0180,09F0,0000,107E   ;2589          RC[0E]_0                         ; INIT EXPECTED DATA
U 107E, 2000,003D,0180,0A08,4200,11AB   ;2590  =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE IB
U 107F, 0818,0038,7580,0800,0000,1229   ;2591          D_K[.20]                         ; SET THE IV BIT
U 1229, 0000,003C,3D80,3C00,0000,1080   ;2592          ID[PSL]_D                        ; IN THE PSL
U 1080, 0000,003D,0180,0800,0000,1189   ;2593  =0      ERLOOP
U 1081, 0F00,003C,0180,0800,0000,122A   ;2594          D_0
U 122A, 0000,003C,3180,3C00,0000,122B   ;2595          ID[CES]_D                        ; CLEAR THE TRAP CODES
U 122B, 0818,0038,3580,0800,0000,122C   ;2596          D_K[.50]                         ; USE A CODE OF 5 ON THE TRAP CODES
U 122C, 0000,003C,3180,3C00,0020,122D   ;2597  SYNC0B: ID[CES]_D,SET.V                  ; EXECUTE THE TEST
U 122D, 0000,003C,3DF0,2C00,0000,122E   ;2598          Q_ID[PSL]                        ; READ THE TRAP CODE
U 122E, 0F19,2034,65C0,0800,0000,122F   ;2599          Q_Q.AND.K[.10],D_0               ; MASK CODE ZERO
U 122F, 001D,2000,0180,0800,0010,1230   ;2600          ALU_Q-D,CLK.UBCC                 ; CHECK
U 1230, 0000,013C,0180,0800,0000,1082   ;2601          Z?
U 1082, 0001,203D,0180,09E8,0000,118C   ;2602  =0      ERROR2,RC[0D]_Q                  ; TRAP CODE ZERO SET
                                        ;2603
                                        ;2604
                                        ;//////////////////////////////////////////////////////////////////////

                                        ;+
                                        ; TRAP CODE 0 FALSE=> ID BUS<6:4>=HLH*-PSL FU*CCL7*-ALU=0*-VDETECT SW*-PSL IV
                                        ;-

U 1083, 0F00,003C,0180,0800,0000,1231   T157S4: D_0
U 1231, 0000,003C,3D80,3C00,0000,1084           ID[PSL]_D                       ; INIT THE PSL
U 1084, 0000,003D,0180,0800,0000,11A3   =0      SUBTEST
U 1085, 0000,003C,0180,0800,0000,1086           NOP
U 1086, 0000,003D,0180,0800,0000,1189   =0      ERLOOP
U 1087, 0F00,003C,0180,0800,0000,1232           D_0
U 1232, 0000,003C,3180,3C00,0000,1233           ID[CES]_D                       ; INIT THE CES REGISTER
U 1233, 0818,0038,3580,0800,0000,1234           D_K[.50]                        ; SETUP TO WRITE CODE 5
U 1234, 0001,C03C,3180,3C00,0070,1235   SYNCOC: ID[CES]_D,ALU_D,SET.CC(INST)    ; EXECUTE THE TEST
U 1235, 0000,003C,31F0,2C00,0000,1236           Q_ID[CES]                       ; GET THE TRAP CODE
U 1236, 0F19,2034,65C0,0800,0000,1237           Q_Q.AND.K[.10],D_0              ; MASK
U 1237, 001D,2000,0180,0800,0010,1238           ALU_Q-D,CLK.UBCC                ; CHECK
U 1238, 0000,013C,0180,0800,0000,1088           Z?
U 1088, 0001,203D,0180,09E8,0000,118C   =0      ERROR2,RC[0D]_Q                 ; TRAP CODE ZERO SET


                                        ;//////////////////////////////////////////////////////////////////////

                                        ;+
                                        ; TRAP CODE ZERO FALSE=> CCL7*EN IV TRAP*PSL IV*ID TO TRAP CODE*-ALU=0*-VDETECT SW
                                        ;-

U 1089, 0000,003C,0180,0800,0000,108A   T157S5: NOP
U 108A, 0000,003D,0180,0800,0000,11A3   =0      SUBTEST
U 108B, 0818,0038,2580,0800,0000,1239           D_K[.A0]                        ; INIT THE PSL
U 1239, 0000,003C,3D80,3C00,0000,108C           ID[PSL]_D
U 108C, 0000,003D,0180,0800,0000,1189   =0      ERLOOP
U 108D, 0F00,003C,0180,0800,0000,123A           D_0
U 123A, 0000,003C,3180,3C00,0000,108E           ID[CES]_D                       ; INIT THE CES
U 108E, 0818,0039,D580,0800,0000,118E   =0      D_K[.6],CALL,J/DC0              ; GENERATE A TRAP CODE OF 6
U 108F, 0001,C03C,3180,3C00,0070,123B   SYNCOD: ID[CES]_D,ALU_D,SET.CC(INST)    ; EXECUTE THE TEST
U 123B, 0000,003C,31F0,2C00,0000,123C           Q_ID[CES]                       ; READ THE CODES
U 123C, 0F19,2034,65C0,0800,0000,123D           Q_Q.AND.K[.10],D_0              ; MASK
U 123D, 001D,2000,0180,0800,0010,123E           ALU_Q-D,CLK.UBCC                ; CHECK
U 123E, 0000,013C,0180,0800,0000,1090           Z?
U 1090, 0001,203D,0180,09E8,0000,118C   =0      ERROR2,RC[0D]_Q                 ; TRAP CODE 0 SET


                                        ;//////////////////////////////////////////////////////////////////////

                                        ;+
                                        ; TRAP CODE 0 FALSE=>CCL7*EN IV TRAP*PSL IV*-ID TO TRAP CODE*-PSL FU*ALU=0
                                        ;-

U 1091, 0000,003C,0180,0800,0000,1092   T157S6: NOP
U 1092, 0000,003D,0180,0800,0000,11A3   =0      SUBTEST
U 1093, 0818,0038,7580,0800,0000,123F           D_K[.20]
U 123F, 0000,003C,3D80,3C00,0000,1094           ID[PSL]_D                       ; INIT THE PSL
U 1094, 0000,003D,0180,0800,0000,1189   =0      ERLOOP
```

```
U 1095, 0F00,003C,0180,0800,0000,1240   ;2660             D_0
U 1240, 0000,003C,3180,3C00,0000,1241   ;2661             ID[CES]_D                        ; INIT THE CES REG
U 1241, 0818,0038,35F8,0800,0000,1242   ;2662             D_K[.50],Q_0                     ; GEN TRAP CODE OF 5
U 1242, 0001,E03C,3180,3C00,0070,1243   ;2663   SYNC0E:   ID[CES]_D,ALU_Q,SET.CC(INST)     ; EXECUTE THE TEST
U 1243, 0000,003C,31F0,2C00,0000,1244   ;2664             Q_ID[CES]                        ; READ THEM BACK
U 1244, 0F19,2034,65C0,0800,0000,1245   ;2665             Q_Q.AND.K[.10],D_0               ; MASK
U 1245, 001D,2000,0180,0800,0010,1246   ;2666             ALU_Q-D,CLK.UBCC                 ; CHECK
U 1246, 0000,013C,0180,0800,0000,1096   ;2667             Z?
U 1096, 0001,203D,0180,09E8,0000,118C   ;2668   =0        ERROR2,RC[0D]_Q                  ; TRAP CODE ZERO SET
                                        ;2669
                                        ;2670   ;//////////////////////////////////////////////////////////////////
                                        ;2671
                                        ;2672   ;+
                                        ;2673   ; TRAP CODE 0 FALSE=> CCL7*-EN IV TRAP*PSL IV*-ID TO TRAP CODE*-PSL FU*EALU<9:8>=01
                                        ;2674   ;-
                                        ;2675
U 1097, 0000,003C,0180,0800,0000,1098   ;2676   T157S7:   NOP
U 1098, 0000,003D,0180,0800,0000,11A3   ;2677   =0        SUBTEST
U 1099, 0018,0038,0980,0A88,0000,109A   ;2678             R[1]_K[.2]                       ; SET ADDRESS OF IB DATA
U 109A, 2000,003D,0180,0A08,4200,11AB   ;2679   =0        ALU_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE IB
U 109B, 0818,0038,7580,0800,0000,1247   ;2680             D_K[.20]
U 1247, 0000,003C,3D80,3C00,0000,1248   ;2681             ID[PSL]_D                        ; INIT THE PSL
U 1248, 0000,003C,6580,0800,0084,709C   ;2682             SC_K[.10]                        ; INIT THE SC FOR EALU DATA
U 109C, 0000,003D,0180,0800,0000,1189   ;2683   =0        ERLOOP
U 109D, 0F00,003C,0180,0800,0000,1249   ;2684             D_0
U 1249, 0000,003C,3180,3C00,0000,124A   ;2685             ID[CES]_D                        ; INIT THE CES REGISTER
U 124A, 0818,0038,3580,0800,0000,124B   ;2686             D_K[.50]                         ; SELECT A CODE OF 5
U 124B, 0000,C03C,3180,3C00,0070,124C   ;2687   SYNC0F:   ID[CES]_D,EALU_SC,SET.CC(INST)   ; EXECUTE THE TEST
U 124C, 0000,003C,31F0,2C00,0000,124D   ;2688             Q_ID[CES]                        ; READ THE TRAP CODES
U 124D, 0F19,2034,65C0,0800,0000,124E   ;2689             Q_Q.AND.K[.10],D_0               ; MASK
U 124E, 001D,2000,0180,0800,0010,124F   ;2690             ALU_Q-D,CLK.UBCC                 ; CHECK
U 124F, 0000,013C,0180,0800,0000,109E   ;2691             Z?
U 109E, 0001,203D,0180,09E8,0000,118C   ;2692   =0        ERROR2,RC[0D]_Q                  ; TRAP CODE 0 SET
                                        ;2693
                                        ;2694   ;//////////////////////////////////////////////////////////////////
                                        ;2695
                                        ;2696   ;+
                                        ;2697   ; TRAP CODE 0 TRUE=> CCL7*EN IV TRAP*PSL IV*-ID TO TRAP CODE*-PSL FU*-ALU=0
                                        ;2698   ;-
                                        ;2699
U 109F, 0018,0038,6580,09F0,0000,10A0   ;2700   T157S8:   RC[0E]_K[.10]                    ; INIT EXPECTED TRAP CODE
U 10A0, 0000,003D,0180,0800,0000,11A3   ;2701   =0        SUBTEST
U 10A1, 0003,003C,0180,0A88,0000,1250   ;2702             R[1]_0                           ; INIT ADDRESS OF IB DATA
U 1250, 0818,0038,7580,0800,0000,1251   ;2703             D_K[.20]
U 1251, 0000,003C,3D80,3C00,0000,10A2   ;2704             ID[PSL]_D                        ; INIT THE PSL
U 10A2, 2000,003D,0180,0A08,4200,11AB   ;2705   =0        ALU_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE IB
U 10A3, 0000,003C,0180,0800,0000,10A4   ;2706             NOP
U 10A4, 0000,003D,0180,0800,0000,1189   ;2707   =0        ERLOOP
U 10A5, 0F00,003C,0180,0800,0000,1252   ;2708             D_0
U 1252, 0000,003C,3180,3C00,0000,1253   ;2709             ID[CES]_D                        ; INIT THE CES REGISTER
U 1253, 0818,0038,3580,0800,0000,1254   ;2710             D_K[.50]                         ; SET TRAP CODE OF 5
U 1254, 0001,C03C,3180,3C00,0070,1255   ;2711   SYNC10:   ID[CES]_D,ALU_D,SET.CC(INST)     ; EXECUTE THE TEST
U 1255, 0000,003C,31F0,2C00,0000,1256   ;2712             Q_ID[CES]                        ; GET THE TRAP CODES
U 1256, 0019,2034,65C0,0800,0000,1257   ;2713             Q_Q.AND.K[.10]                   ; MASK
U 1257, 0810,0038,0180,0970,0000,1258   ;2714             D_RC[0E]
```

```
U 1258, 001D,2000,0180,0800,0010,1259   ;2715           ALU_Q-D,CLK.UBCC                 ; CHECK
U 1259, 0000,013C,0180,0800,0000,10A6   ;2716           Z?
U 10A6, 0001,203D,0180,09E8,0000,118C   ;2717   =0      ERROR2,RC[OD]_Q                  ; TRAP CODE 0 DID NOT SET
                                        ;2718
                                        ;2719
                                        ;2720   ;//////////////////////////////////////////////////////////////////////
                                        ;2721
                                        ;2722   ;+
                                        ;2723   ; TRAP CODE 0 TRUE=>CCL7*EN IV TRAP*PSL IV*-ID TO TRAP CODE*-PSL FU*-ALU SIGN*AMX SI
                                        ;2724   ;-
                                        ;2725
U 10A7, 0000,003C,0180,0800,0000,10A8   ;2726   T157S9: NOP
U 10A8, 0000,003D,0180,0800,0000,11A3   ;2727   =0      SUBTEST
U 10A9, 0018,0038,1180,0A88,0000,10AA   ;2728           R[1]_K[.4]                       ; SET ADDRESS OF IB DATA
U 10AA, 2000,003D,0180,0A08,4200,11AB   ;2729   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT  ; LOAD THE IB
U 10AB, 0818,0038,7580,0800,0000,125A   ;2730           D_K[.20]
U 125A, 0000,003C,3D80,3C00,0000,10AC   ;2731           ID[PSL]_D                        ; INIT THE PSL
U 10AC, 0000,003D,0180,0800,0000,11A8   ;2732   =0      CALL,J/DISPAT                    ; LATCH THE DATA TYPE
U 10AD, 0000,003C,0180,0800,0000,10AE   ;2733           NOP
U 10AE, 0000,003D,0180,0800,0000,1189   ;2734   =0      ERLOOP
U 10AF, 0F00,003C,0180,0800,0000,125B   ;2735           D_0
U 125B, 0000,003C,3180,3C00,0000,10B0   ;2736           ID[CES]_D                        ; INIT THE CES REGISTER
U 10B0, 0818,0039,8980,0800,0000,118E   ;2737   =0      D_K[.D],CALL,J/DCO               ; GENERATE TRAP CODE 5 WITH THE SIGN BIT SET
U 10B1, 0018,0038,41C0,0800,0000,125C   ;2738           Q_K[.80]                         ; SET THE SIGN BIT IN Q
U 125C, 001D,C014,3180,3C00,0070,125D   ;2739   SYNC11: ID[CES]_D,ALU_D+Q,SET.CC(INST)   ; EXECUTE THE TEST
U 125D, 0000,003C,31F0,2C00,0000,125E   ;2740           Q_ID[CES]                        ; READ THE TRAP CODES
U 125E, 0019,2034,65C0,0800,0000,125F   ;2741           Q_Q.AND.K[.10]                   ; MASK
U 125F, 0810,0038,0180,0970,0000,1260   ;2742           D_RC[OE]                         ; GET EXPECTED VALUE
U 1260, 001D,2000,0180,0800,0010,1261   ;2743           ALU_Q-D,CLK.UBCC                 ; CHECK
U 1261, 0000,013C,0180,0800,0000,10B2   ;2744           Z?
U 10B2, 0001,203D,0180,09E8,0000,118C   ;2745   =0      ERROR2,RC[OD]_Q                  ; TRAP CODE 0 DID NOT SET
                                        ;2746
                                        ;2747
                                        ;2748   ;//////////////////////////////////////////////////////////////////////
                                        ;2749
                                        ;2750   ;+
                                        ;2751   ; TRAP CODE 0 TRUE=> CCL7*EN IV TRAP*PSL IV*-ID TO TRAP CODE*-PSL FU*ALU SIGN*-AMX S
                                        ;2752   ;-
                                        ;2753
U 10B3, 0000,003C,0180,0800,0000,10B4   ;2754   T157SA: NOP
U 10B4, 0000,003D,0180,0800,0000,11A3   ;2755   =0      SUBTEST
U 10B5, 0818,0038,7580,0800,0000,1262   ;2756           D_K[.20]
U 1262, 0000,003C,3D80,3C00,0000,10B6   ;2757           ID[PSL]_D                        ; INIT THE PSL
U 10B6, 0000,003D,0180,0800,0000,1189   ;2758   =0      ERLOOP
U 10B7, 0F00,003C,0180,0800,0000,1263   ;2759           D_0
U 1263, 0000,003C,3180,3C00,0000,1264   ;2760           ID[CES]_D                        ; INIT THE CES
U 1264, 0818,0038,35C0,0800,0000,1265   ;2761           D_K[.50],Q_ALU                   ; GET TRAP CODE 5
U 1265, 001D,C014,3180,3C00,0070,1266   ;2762   SYNC12: ID[CES]_D,ALU_D+Q,SET.CC(INST)   ; EXECUTE THE TEST
U 1266, 0000,003C,31F0,2C00,0000,1267   ;2763           Q_ID[CES]                        ; READ THE TRAP CODES
U 1267, 0019,2034,65C0,0800,0000,1268   ;2764           Q_Q.AND.K[.10]                   ; MASK
U 1268, 0810,0038,0180,0970,0000,1269   ;2765           D_RC[OE]                         ; GET EXPECTED DATA
U 1269, 001D,2000,0180,0800,0010,126A   ;2766           ALU_Q-D,CLK.UBCC                 ; CHECK
U 126A, 0000,013C,0180,0800,0000,10B8   ;2767           Z?
U 10B8, 0001,203D,0180,09E8,0000,118C   ;2768   =0      ERROR2,RC[OD]_Q                  ; TRAP CODE 0 DID NOT SET
                                        ;2769
```

```
                                              ;2770
                                              ;2771     ;//////////////////////////////////////////////////////////////////////
                                              ;2772
                                              ;2773     ;+
                                              ;2774     ; ID TO TRAP CODE FALSE=> ID BUS<6:4>=LLH*-PSL IV
                                              ;2775     ;-
                                              ;2776
U 10B9, 0000,003C,0180,0800,0000,10BA         ;2777     T157SB: NOP
U 10BA, 0000,003D,0180,0800,0000,11A3         ;2778     =0      SUBTEST
U 10BB, 0F03,003C,0180,09F0,0000,126B         ;2779             D_0,RC[OE]_0                     ; SET EXPECTED VALUE OF TRAP CODES
U 126B, 0000,003C,3D80,3C00,0000,10BC         ;2780             ID[PSL]_D                        ; INIT THE PSL
U 10BC, 0000,003D,0180,0800,0000,1189         ;2781     =0      ERLOOP
U 10BD, 0F00,003C,0180,0800,0000,126C         ;2782             D_0
U 126C, 0000,003C,3180,3C00,0000,126D         ;2783             ID[CES]_D                        ; INIT THE CES
U 126D, 0818,0038,6580,0800,0000,126E         ;2784             D_K[.10]
U 126E, 0000,003C,3180,3C00,0000,126F         ;2785     SYNC13: ID[CES]_D                        ; EXECUTE THE TEST
U 126F, 0000,003C,31F0,2C00,0000,1270         ;2786             Q_ID[CES]                        ; READ THE TRAP CODES
U 1270, 0F1C,0034,01C0,0A00,0000,1271         ;2787             Q_Q.AND.R[0],D_0                 ; MASK
U 1271, 001D,2000,0180,0800,0010,1272         ;2788             ALU_Q-D,CLK.UBCC                 ; CHECK
U 1272, 0000,013C,0180,0800,0000,10BE         ;2789             Z?
U 10BE, 0001,203D,0180,09E8,0000,118C         ;2790     =0      ERROR2,RC[OD]_Q                  ; TRAP CODES DID NOT STAY ZERO
                                              ;2791
                                              ;2792     ;//////////////////////////////////////////////////////////////////////
                                              ;2793
                                              ;2794     ;+
                                              ;2795     ; ID TO TRAP CODE FALSE=> ID BUS<6:4>=HHL*-PSL DV
                                              ;2796     ;-
                                              ;2797
U 10BF, 0000,003C,0180,0800,0000,10C0         ;2798     T157SC: NOP
U 10C0, 0000,003D,0180,0800,0000,11A3         ;2799     =0      SUBTEST
U 10C1, 0000,003C,0180,0800,0000,10C2         ;2800             NOP
U 10C2, 0000,003D,0180,0800,0000,1189         ;2801     =0      ERLOOP
U 10C3, 0F00,003C,0180,0800,0000,1273         ;2802             D_0
U 1273, 0000,003C,3180,3C00,0000,1274         ;2803             ID[CES]_D                        ; INIT THE CES
U 1274, 0818,0038,7980,0800,0000,1275         ;2804             D_K[.30]                         ; GEN TRAP CODE 6
U 1275, 0500,003C,0180,0800,0000,1276         ;2805             D_D.LEFT                         ; ...
U 1276, 0000,003C,3180,3C00,0000,1277         ;2806     SYNC14: ID[CES]_D                        ; EXECUTE THE TEST
U 1277, 0000,003C,31F0,2C00,0000,1278         ;2807             Q_ID[CES]                        ; GET THE TRAP CODES
U 1278, 0F1C,0034,01C0,0A00,0000,1279         ;2808             Q_Q.AND.R[0],D_0                 ; MASK
U 1279, 001D,2000,0180,0800,0010,127A         ;2809             ALU_Q-D,CLK.UBCC                 ; CHECK
U 127A, 0000,013C,0180,0800,0000,10C4         ;2810             Z?
U 10C4, 0001,203D,0180,09E8,0000,118C         ;2811     =0      ERROR2,RC[OD]_Q                  ; TRAP CODES DID NOT REMAIN ZERO
                                              ;2812
                                              ;2813
                                              ;2814     ;//////////////////////////////////////////////////////////////////////
                                              ;2815
                                              ;2816     ;+
                                              ;2817     ; ID TO TRAP CODE TRUE=> ID<6:4>=HLH*PSL FU
                                              ;2818     ;-
                                              ;2819
U 10C5, 0018,0038,3580,09F0,0000,10C6         ;2820     T157SD: RC[OE]_K[.50]                    ; SET THE EXPECTED DATA
U 10C6, 0000,003D,0180,0800,0000,11A3         ;2821     =0      SUBTEST
U 10C7, 0818,0038,3180,0800,0000,127B         ;2822             D_K[.40]                         ; INIT THE PSL
U 127B, 0000,003C,3D80,3C00,0000,10C8         ;2823             ID[PSL]_D
U 10C8, 0000,003D,0180,0800,0000,1189         ;2824     =0      ERLOOP
```

```
U 10C9, 0F00,003C,0180,0800,0000,127C   ;2825           D_0
U 127C, 0000,003C,3180,3C00,0000,127D   ;2826           ID[CES]_D                       ; INIT THE CES
U 127D, 0810,0038,0180,0970,0000,127E   ;2827           D_RC[0E]                        ; GET TRAP CODE OF 5
U 127E, 0000,003C,3180,3C00,0000,127F   ;2828   SYNC15: ID[CES]_D                       ; EXECUTE THE TEST
U 127F, 0000,003C,31F0,2C00,0000,1280   ;2829           Q_ID[CES]                       ; READ THE TRAP CODES
U 1280, 001C,0034,01C0,0A00,0000,1281   ;2830           Q_Q.AND.R[0]                    ; MASK
U 1281, 001D,2000,0180,0800,0010,1282   ;2831           A[U_Q-D,CLK.UBCC                ; CHECK
U 1282, 0000,013C,0180,0800,0000,10CA   ;2832           Z?
U 10CA, 0001,203D,0180,09E8,0000,118C   ;2833   =0      ERROR2,RC[0D]_Q                 ; TRAP CODES INCORRECT
U 10CB, 0000,003C,0180,0800,0000,10CC   ;2834           NOP
                                        ;2835
                                        ;2836
                                        ;2837   ; THE FOLLOWING IS THE IB DATA FOR THE ABOVE TEST:
                                        ;2838   ;% 0
                                        ;2839   ; SUBTEST 3, 4, 5, 6, AND 8
                                        ;2840   ;$ 0033
                                        ;2841   ; SUBTEST 7
                                        ;2842   ;$ 0040
                                        ;2843   ; SUBTEST 9 AND 10
                                        ;2844   ;$ 6080
                                        ;2845
                                        ;2846
```

```
                                         .PAGE   "TEST 158       PSL CLEAR ON INTERRUPT AND EXCEPTION ACKNOWLEDGE"
                                         ;**********************************************************************
                                         ;++
                                         ; TEST  158     PSL CLEAR ON INTERRUPT AND EXCEPTION ACKNOWLEDGE
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS TEST CHECKS THAT ALL THE BITS IN THE PSL REGISTER, EXCEPT
                                         ;       FOR THE "TRAP PENDING" BIT, CLEAR ON AN INTERRUPT ACKNOWLEDGE, AND
                                         ;       THAT ALL THE BITS EXCEPT THE TP, PREVIOUS MODE, AND IPL BITS, CLEAR
                                         ;       ON AN EXCEPTION ACKNOWLEDGE.
                                         ;
                                         ;       SUBTST 1 - CHECK THE INTERRUPT ACKNOWLEDGE
                                         ;       SUBTST 2 - CHECK THE EXCEPTION ACKNOWLEDGE
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;       THIS TEST CHECKS THE PSL REGISTER CLEAR INPUTS.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       DATA: EXPECTED PSL REGISTER
                                         ;             RECEIVED PSL REGISTER
                                         ;
                                         ; SYNC POINT DESCRIPTION
                                         ;       SUBTST 1 - SYNC16--EXECUTE THE INTERRUPT ACKNOWLEDGE
                                         ;       SUBTST 2 - SYNC17--EXECUTE THE EXCEPTION ACKNOWLEDGE
                                         ;--
                                         ;**********************************************************************
                                         =0
U 10CC, 0018,0039,0980,09F8,0000,1175    T158:   NEWTST[.2]
U 10CD, 0000,003C,0180,0800,0000,10CE            NOP
U 10CE, 0000,003D,0180,0800,0000,11B2    =0      CALL,J/UNJAM                   ; CLEAR ANY SBI INTERRUPTS
U 10CF, 0818,0038,1180,0800,0000,1283            D_K[.4]                        ; GENERATE EXPECTED DATA
U 1283, 0B00,003C,0180,0800,0000,1284            D_D.SWAP
U 1284, 0001,003C,0180,09F0,0000,10D0            RC[OE]_D                       ; SAVE

                                         ;/////////////////////////////////////////////////////////////////////

                                         ;+
                                         ; FIRST CHECK THE INTERRUPT ACKNOWLEDGE
                                         ;-

                                         =0
U 10D0, 0000,003D,0180,0800,0000,11A3    T158S1: SUBTEST
U 10D1, 0000,003C,0180,0800,0000,10D2            NOP
U 10D2, 0000,003D,0180,0800,0000,1189    =0      ERLOOP
U 10D3, 081B,0000,0580,0800,0000,1285            D_0-K[.1]                      ; SET PSL TO ALL ONES
U 1285, 0000,003C,3D80,3C00,0000,1286            ID[PSL]_D
U 1286, 0810,0038,0180,3D70,8000,1287    SYNC16: D_RC[OE],ID[IBUF]_D,INTRPT.ACK ; EXECUTE THE TEST
U 1287, 0000,003C,3DF0,2C00,0000,1288            Q_ID[PSL]                      ; GET THE PSL
U 1288, 001D,2000,0180,0800,0010,1289            A[U_Q-D,CLK.UBCC               ; CHECK
U 1289, 0000,013C,0180,0800,0000,10D4            Z?
U 10D4, 0001,203D,0180,09E8,0000,118C    =0      ERROR2,RC[OD]_Q                ; INCORRECT VALUE IN PSL

                                         ;/////////////////////////////////////////////////////////////////////

                                         ;+
                                           ;2902     ; NOW CHECK WITH EXCEPTION ACKNOWLEDGE
                                           ;2903     ;-
                                           ;2904
U 10D5, 0000,003C,0180,0800,0000,10D6      ;2905     T158S2: NOP
U 10D6, 0000,003D,0180,0800,0000,11A3      ;2906     =0      SUBTEST
U 10D7, 0818,0038,AD80,0800,0000,128A      ;2907             D_K[.DFCF]                          ; GENERATE EXPECTED DATA
U 128A, 0819,0034,4D80,0800,0000,128B      ;2908             D_D.AND.K[.FF00]
U 128B, 0819,0014,1180,0800,0000,128C      ;2909             D_D+K[.4]
U 128C, 0B00,003C,0180,0800,0000,128D      ;2910             D_D.SWAP
U 128D, 0001,003C,0180,09F0,0000,10D8      ;2911             RC[0E]_D                            ; SAVE
U 10D8, 0000,003D,0180,0800,0000,1189      ;2912     =0      ERLOOP
U 10D9, 081B,0000,0580,0800,0000,128E      ;2913             D_0-K[.1]                           ; LOAD PSL WITH ALL ONES
U 128E, 0000,003C,3D80,3C00,0000,128F      ;2914             ID[PSL]_D
U 128F, 0810,0038,0180,3D70,C000,1290      ;2915     SYNC17: D_RC[0E],ID[IBUF]_D,EXCEPT.ACK  ; EXECUTE THE TEST
U 1290, 0000,003C,3DF0,2C00,0000,1291      ;2916             Q_ID[PSL]                           ; GET THE PSL
U 1291, 001D,2000,0180,0800,0010,1292      ;2917             ALU_Q-D,CLK.UBCC                    ; CHECK
U 1292, 0000,013C,0180,0800,0000,10DA      ;2918             Z?
U 10DA, 0001,203D,0180,09E8,0000,118C      ;2919     =0      ERROR2,RC[0D]_Q                     ; PSL BITS DID NOT CLEAR
U 10DB, 0000,003C,0180,0800,0000,10DC      ;2920             NOP
                                           ;2921
                                           ;2922
```

```
                                          .PAGE   "TEST 159       PREVIOUS MODE BITS SELECTED BY 'CHK CHG MODE'"
                                          ;*********************************************************************
                                          ;++
                                          ; TEST  159     PREVIOUS MODE BITS SELECTED BY "CHK CHG MODE"
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS TEST CHECKS THAT THE PREVIOUS MODE BITS ARE SET FROM THE
                                          ;       CURRENT MODE BITS WHEN "CHK CHG MODE" IS INVOKED DURING AN
                                          ;       ID BUS WRITE TO THE PSL.
                                          ;       THIS IS DONE BY INITIALIZING THE CURRENT MODE TO 01 AND THE PREV
                                          ;       MODE TO 10, EXECUTING THE TEST, AND CHECKING THE PREV MODE BITS
                                          ;       FOR 01. THEN THE COMPLIMENT PATTERN IS TESTED.
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;       THIS TEST CHECKS THE MULTIPLEXOR THAT FEEDS THE PREVIOUS MODE BITS.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       DATA: EXPECTED PREVIOUS MODE BITS
                                          ;             RECEIVED PREVIOUS MODE BITS
                                          ;             LOOP COUNT -- 2= CURRENT MODE 01, 1= CURRENT MODE 10
                                          ;
                                          ; SYNC POINT DESCRIPTION
                                          ;       ADDRESS SYNC18--LOAD THE PREVIOUS MODE FROM THE CURRENT MODE
                                          ;--
                                          ;*********************************************************************
                                          =0
U 10DC, 0000,003D,0180,0800,0000,1175     T159:   NEWTST
U 10DD, 0018,0038,0D80,09F8,0000,10DE             RC[0F]_K[.3]                    ; THREE ARGUMENTS FOR TYPEOUT
U 10DE, 0818,0039,D180,0800,0000,118E     =0      D_K[.C0],CALL,J/DC0             ; GENERATE THE MASK
U 10DF, 0000,003C,01F8,0800,0084,70E0             Q_0,SC_K[.8]                    ; SETUP SC FOR SHIFT
U 10E0, 0000,003D,0180,0800,0000,1191     =0      CALL,J7DC3                      ; D CONTAINS C003
U 10E1, 0B00,003C,0180,0800,0000,1293             D_D.SWAP
U 1293, 0001,003C,0180,0A80,0000,1294             R[0]_D                          ; SAVE MASK = 03C00000
U 1294, 0818,0038,0580,0800,0000,1295             D_K[.1]                         ; GENERATE THE INITIAL DATA
U 1295, 0B00,003C,0180,0800,0000,1296             D_D.SWAP
U 1296, 0001,003C,0180,0A88,0000,1297             R[1]_D                          ; SAVE IN R1
U 1297, 0818,0038,3180,0800,0000,1298             D_K[.40]                        ; GENERATE THE EXPECTED DATA
U 1298, 0D00,003C,0180,0800,0000,1299             D_DAL.SC                        ; D CONTAINS 4000
U 1299, 0819,0014,0580,0800,0000,129A             D_D+K[.1]                       ; D CONTAINS 4001
U 129A, 0B00,003C,0180,0800,0000,129B             D_D.SWAP                        ; D CONTAINS 01400000
U 129B, 0001,003C,0180,09F0,0000,129C             RC[0E]_D                        ; SAVE

                                          ;//////////////////////////////:////////////////////////////////////////

                                          ;+
                                          ; CHECK THE "CHECK CHANGE MODE" FUNCTION
                                          ;-

U 129C, 0018,0038,0980,09E0,0000,10E2             RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 10E2, 0000,003D,0180,0800,0000,1189     =0      ERLOOP
U 10E3, 0800,003C,0180,0A08,0000,129D     T159L1: D_R[1]                          ; GET INITIAL DATA
U 129D, 0000,003C,3D80,3C00,0000,129E             ID[PSL]_D                       ; INIT THE PSL
U 129E, 0000,003C,3D80,3C00,0400,129F     SYNC18: ID[PSL]_D,MSC/CHK.CHM           ; EXECUTE THE TEST
U 129F, 0000,003C,3DF0,2C00,0000,12A0             Q_ID[PS[]                       ; READ THE PSL
U 12A0, 001C,0034,01C0,0A00,0000,12A1             Q_Q.AND.R[0]                    ; MASK
```

```
U 12A1, 0810,0038,0180,0970,0000,12A2   ;2978             D_RC[0E]
U 12A2, 001D,2000,0180,0800,0010,12A3   ;2979             A[U_Q-D,CLK.UBCC                 ; CHECK
U 12A3, 0000,013C,0180,0800,0000,10E4   ;2980             Z?
U 10E4, 0001,203D,0180,09E8,0000,118C   ;2981     =0      ERROR2,RC[0D]_Q                  ; PREVIOUS MODE BITS INCORRECT
                                        ;2982
                                        ;2983     ;+
                                        ;2984     ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS TEST
                                        ;2985     ;-
                                        ;2986
U 10E5, 0818,0038,0980,0800,0000,12A4   ;2987             D_K[.2]                          ; GENERATE THE INITIAL DATA
U 12A4, 0800,003C,0180,0800,0084,72A5   ;2988             D_D.SWAP,SC_K[.8]
U 12A5, 0001,003C,0180,0A88,0000,12A6   ;2989             R[1]_D                           ; SAVE
U 12A6, 0818,0038,41F8,0800,0000,12A7   ;2990             D_K[.80],Q_0            ; GENERATE THE EXPECTED DATA
U 12A7, 0D00,003C,0180,0800,0000,12A8   ;2991             D_DAL.SC
U 12A8, 0819,0014,0980,0800,0000,12A9   ;2992             D_D+K[.2]
U 12A9, 0800,003C,0180,0800,0000,12AB   ;2993             D_D.SWAP
U 12AB, 0001,003C,0180,09F0,0000,12AC   ;2994             RC[0E]_D                         ; SAVE EQUALS 02800000
U 12AC, 0810,0038,0180,0960,0000,12AD   ;2995             D_RC[0C]
U 12AD, 0019,8000,0580,09E0,0010,12AE   ;2996             RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT LOP COUNT
U 12AE, 0000,013C,0180,0800,0000,10E6   ;2997             Z?
U 10E6, 0000,003C,0180,0800,0000,10E3   ;2998     =0      J/T159L1                         ; CONTINUE
U 10E7, 0000,003C,0180,0800,0000,10E8   ;2999             NOP
                                        ;3000
                                        ;3001
```

```
                                       .PAGE   "TEST 15A       CURRENT MODE BITS AND CHECK CHANGE MODE"
                                       ;*****************************************************************************
                                       ;++
                                       ; TEST  15A     CURRENT MODE BITS AND CHECK CHANGE MODE
                                       ;
                                       ; TEST DESCRIPTION
                                       ;       THIS TEST CHECKS THAT THE CURRENT MODE BITS ARE LOADED
                                       ;       CORRECTLY WHEN WRITTEN FROM THE ID BUS AND "CHK CNG MODE" IS
                                       ;       INVOKED. THE FOLLOWING TABLE SHOWS THE DATA PATTERNS AND EXPECTED
                                       ;       CURRENT MODE FOR THOSE PATTERNS.
                                       ;
                                       ;                INITIAL CURRENT MODE    ID BUS         EXPECTED CURRENT MODE
                                       ;                --------------------    ------         ----------------
                                       ;                        00                00                  00
                                       ;                                          01                  00
                                       ;                                          10                  00
                                       ;                                          11                  00
                                       ;                        01                00                  00
                                       ;                                          01                  01
                                       ;                                          10                  01
                                       ;                                          11                  01
                                       ;                        10                00                  00
                                       ;                                          01                  01
                                       ;                                          10                  10
                                       ;                                          11                  10
                                       ;                        11                00                  00
                                       ;                                          01                  01
                                       ;                                          10                  10
                                       ;                                          11                  11
                                       ;
                                       ; LOGIC DESCRIPTION
                                       ;       THIS TEST CHECKS THE CURRENT MODE AND ID BUS COMPARATOR AND
                                       ;       THE MULTIPLEXOR THAT FEEDS THE CURRENT MODE BITS ON THE CEH MODULE.
                                       ;
                                       ; ERROR DESCRIPTION
                                       ;       DATA: EXPECTED CURRENT MODE BITS
                                       ;             RECEIVED CURRENT MODE BITS
                                       ;             LOOP COUNT FOR THE ID BUS DATA PATTERNS, I.E.
                                       ;               4= 00, 3=01, 2=10, AND 1= 11
                                       ;             LOOP COUNT FOR THE INITIAL CURRENT MODE, I.E.
                                       ;               4= 00, 3= 01, 2= 10, 1= 11
                                       ;
                                       ; SYNC POINT DESCRIPTION
                                       ;       ADDRESS SYNC19--CURRENT MODE BITS ARE LOADED WITH "CHK CNG MODE" INVOKED.
                                       ;--
                                       ;*****************************************************************************
                                       =0
U 10E8, 0018,0039,1180,09F8,0000,1175  T15A:   NEWTST[.4]
U 10E9, 0818,0038,0580,0800,0000,12AF          D_K[.1]                         ; GENERATE AN INCREMENT VALUE
U 12AF, 0800,003C,0180,0800,0000,12B0          D_D.SWAP                        ; FOR THE CURRENT MODE BITS
U 12B0, 0001,003C,0180,0A88,0000,12B1          R[1]_D                          ; SAVE
U 12B1, 0018,0038,0180,0A80,0000,12B2          R[0]_K[.8]                      ; SET ADDRESS OF EXPECTED DATA
U 12B2, 0818,0038,0D80,0800,0000,12B3          D_K[.3]                         ; GENERATE A MASK FOR THE CURRENT
U 12B3, 0800,003C,0180,0800,0000,12B4          D_D.SWAP                        ; MODE BITS
U 12B4, 0001,003C,0180,0A90,0000,12B5          R[2]_D                          ; SAVE
```

```
U 12B5, 0003,003C,0180,0AA0,0000,12B6   ;3057           R[4]_0                          ; INIT INITIAL VALUE OF CURRENT MODE BITS
                                        ;3058
                                        ;3059   ;//////////////////////////////////////////////////////////////////////
                                        ;3060
                                        ;3061   ;+
                                        ;3062   ; START THE TEST
                                        ;3063   ;-
                                        ;3064
U 12B6, 0018,0038,1180,09D8,0000,12B7   ;3065           RC[0B]_K[.4]                    ; SET LOOP COUNT OF INITIAL VALUE
U 12B7, 0018,0038,1180,09E0,0000,12B8   ;3066   T15AL1: RC[0C]_K[.4]                    ; SET LOOP COUNT OF ID BUS DATA
U 12B8, 0003,003C,0180,0A98,0000,12B9   ;3067           R[3]_0                          ; INIT ID BUS DATA
U 12B9, 0000,003C,0180,0A00,0200,12BA   ;3068   T15AL2: VA_R[0]                         ; LAOD ADDRESS OF EXPECTED DATA
U 12BA, 0000,003C,0180,C800,0000,12BB   ;3069           D[LONG]_CACHE.P                 ; FETCH EXPECTED DATA
U 12BB, 0001,003C,0180,09F0,0000,10EA   ;3070           RC[0E]_D                        ; SAVE
U 10EA, 0000,003D,0180,0800,0000,1189   ;3071   =0      ERLOOP
U 10EB, 0800,003C,0180,0A20,0000,12BC   ;3072           D_R[4]                          ; INIT THE PSL
U 12BC, 0000,003C,3D80,3C00,0000,12BD   ;3073           ID[PSL]_D
U 12BD, 0800,003C,0180,0A18,0000,12BE   ;3074           D_R[3]                          ; GET ID BUS DATA
U 12BE, 0000,003C,3D80,3C00,0400,12BF   ;3075   SYNC19: ID[PSL]_D,MSC/CHK.CHM           ; EXECUTE THE TEST
U 12BF, 0810,0038,3DF0,2D70,0000,12C0   ;3076           Q_ID[PSL],D_RC[0E]              ; READ THE PSL
U 12C0, 001C,0034,01C0,0A10,0000,12C1   ;3077           Q_Q.AND.R[2]                    ; MASK
U 12C1, 001D,2000,0180,0800,0010,12C2   ;3078           ALU_Q-D,CLK.UBCC                ; CHECK
U 12C2, 0000,013C,0180,0800,0000,10EC   ;3079           Z?
U 10EC, 0001,203D,0180,09E8,0000,118C   ;3080   =0      ERROR2,RC[0D]_Q                 ; CURRENT MODE BITS INCORRECT
                                        ;3081
                                        ;3082   ;+
                                        ;3083   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS TEST
                                        ;3084   ;-
                                        ;3085
U 10ED, 0000,003C,0180,0A00,0000,12C3   ;3086           LAB_R[0]
U 12C3, 0018,0014,1180,0A80,0000,12C5   ;3087           R[0]_LA+K[.4]                   ; INCREMENT ADR OF EXPECTED DATA
U 12C5, 0800,003C,0180,0A18,0000,12C6   ;3088           D_R[3]                          ; INCREMENT ID BUS DATA
U 12C6, 0000,003C,0180,0A08,0000,12C7   ;3089           LAB_R[1]
U 12C7, 001C,2014,0180,0A98,0000,12C8   ;3090           R[3]_LA+D                       ; ...
U 12C8, 0810,0038,0180,0960,0000,12C9   ;3091           D_RC[0C]
U 12C9, 0019,8000,0580,09E0,0010,12CA   ;3092           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP
U 12CA, 0000,013C,0180,0800,0000,10EE   ;3093           Z?
U 10EE, 0000,003C,0180,0800,0000,12B9   ;3094   =0      J/T15AL2                        ; CONTINUE
U 10EF, 0800,003C,0180,0A20,0000,12CB   ;3095           D_R[4]                          ; INCREMENT DATA TO INIT CURRENT MODE
U 12CB, 0000,003C,0180,0A08,0000,12CC   ;3096           LAB_R[1]
U 12CC, 001C,2014,0180,0AA0,0000,12CD   ;3097           R[4]_LA+D                       ; ...
U 12CD, 0810,0038,0180,0958,0000,12CE   ;3098           D_RC[0B]
U 12CE, 0019,8000,0580,09D8,0010,12CF   ;3099           RC[0B]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
U 12CF, 0000,013C,0180,0800,0000,10F0   ;3100           Z?
U 10F0, 0000,003C,0180,0800,0000,12B7   ;3101   =0      J/T15AL1
U 10F1, 0000,003C,0180,0800,0000,10F2   ;3102           NOP
                                        ;3103
                                        ;3104
                                        ;3105   ; THE FOLLOWING IS THE EXPECTED DATA FOR THE ABOVE TEST:
                                        ;3106   ;% 8
                                        ;3107   ;$ 0000,0000
                                        ;3108   ;$ 0000,0000
                                        ;3109   ;$ 0000,0000
                                        ;3110   ;$ 0000,0000
                                        ;3111   ;$ 0000,0000
```

```
;3112   ;$ 0000,0100
;3113   ;$ 0000,0100
;3114   ;$ 0000,0100
;3115   ;$ 0000,0000
;3116   ;$ 0000,0100
;3117   ;$ 0000,0200
;3118   ;$ 0000,0200
;3119   ;$ 0000,0000
;3120   ;$ 0000,0100
;3121   ;$ 0000,0200
;3122   ;$ 0000,0300
;3123
;3124
;3125
```

```
                                          .PAGE   "TEST 15B       CURRENT MODE AND PREV MODE BITS LOAD DURING EXCEPTION ACK"
                                          ;**************************************************************************
                                          ;++
                                          ;
                                          ; TEST  15B     CURRENT MODE AND PREV MODE BITS LOAD DURING EXCEPTION ACK
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS TEST CHECKS THAT THE PREVIOUS MODE BITS ARE LOADED FROM THE
                                          ;       CURRENT MODE BITS AND THAT THE CURRENT MODE BITS CLEAR WHEN AN
                                          ;       EXCEPTION ACK IS EXECUTED.
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;       THIS TEST CHECKS PART OF THE LOGIC ON THE CEH MODULE THAT
                                          ;       CONTROLS THE LOADING OF THESE BITS.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       DATA: EXPECTED PSL
                                          ;             RECEIVED PSL
                                          ;
                                          ; SYNC POINT DESCRIPTION
                                          ;       ADDRESS SYNC3C--CURRENT MODE AND PREV MODE BITS ARE LOADED
                                          ;--
                                          ;*************************************************************************
                                          =0
U 10F2, 0018,0039,0980,09F8,0000,1175     T15B:   NEWTST[.2]
U 10F3, 0000,003C,01F8,0800,0084,70F4             SC_K[.8],Q_0
U 10F4, 0818,0039,8580,0800,0000,118E     =0      D_K[.C],CA[L,J/DC0             ; GENERATE THE MASK
U 10F5, 0D00,003C,0180,0800,0000,12D0             D_DAL.SC                       ; EQUALS 0000C000
U 12D0, 0B00,003C,01E0,0800,0000,12D1             Q_D,D_D.SWAP                   ; GENERATE EXPECTED DATA
U 12D1, 0C01,003C,0180,09F0,0000,12D2             RC[0E]_D,D_Q                   ; D CONTAINS 0000C000
U 12D2, 0819,0014,0D80,0800,0000,12D3             D_D+K[.3]                      ; D CONTAINS 0000C003
U 12D3, 0B00,003C,0180,0800,0000,12D4             D_D.SWAP                       ; D CONTAINS 03C00000
U 12D4, 0001,003C,0180,0A80,0000,12D5             R[0]_D                         ; SAVE AS MASK
U 12D5, 0818,0038,0D80,0800,0000,12D6             D_K[.3]
U 12D6, 0B00,003C,0180,0800,0000,12D7             D_D.SWAP                       ; GENERATE INITIAL PSL DATA
U 12D7, 0001,003C,0180,0A88,0000,10F6             R[1]_D

                                          ;//////////////////////////////////////////////////////////////////////////
                                          ;+
                                          ; START THE TEST
                                          ;-

                                          =0
U 10F6, 0000,003D,0180,0800,0000,1189     T15BS1: ERLOOP
U 10F7, 0800,003C,0180,0A08,0000,12D8             D_R[1]                         ; INITIALIZE THE PSL
U 12D8, 0000,003C,3D80,3C00,0000,12D9             ID[PSL]_D                      ; ...
U 12D9, 0810,0038,0180,0970,C000,12DA     SYNC3C: EXCEPT.ACK,D_RC[0E]            ; EXECUTE THE TEST
U 12DA, 0000,003C,3DF0,2C00,0000,12DB             Q_ID[PSL]                      ; READ THE PSL BACK
U 12DB, 001C,0034,01C0,0A00,0000,12DC             Q_Q.AND.R[0]                   ; MASK
U 12DC, 001D,2000,0180,0800,0010,12DD             A[U_Q-D,CLK.UBCC               ; CHECK
U 12DD, 0000,013C,0180,0800,0000,10F8             Z?
U 10F8, 0001,203D,0180,09E8,0000,118C     =0      ERROR2,RC[0D]_Q                ; PSL INCORRECT
U 10F9, 0000,003C,0180,0800,0000,10FA             NOP
```

```
                                       ;3180   .PAGE   "TEST 15C       PSL 'IS' BIT LOAD DURING INTERRUPT ACKNOWLEDGE"
                                       ;3181   ;****************************************************************************
                                       ;3182   ;++
                                       ;3183   ; TEST  15C     PSL 'IS' BIT AND INTERRUPT ACKNOWLEDGE
                                       ;3184   ;
                                       ;3185   ; TEST DESCRIPTION
                                       ;3186   ;       THIS TEST CHECKS THAT THE "INTERRUPT STACK" BIT IN THE PSL DOES
                                       ;3187   ;       NOT GET LOADED WITH THE ID BUS DATA DURING AN INTERRUPT ACKNOWLEDGE.
                                       ;3188   ;
                                       ;3189   ; LOGIC DESCRIPTION
                                       ;3190   ;       THIS TEST CHECKS THE MULTIPLEXOR THAT FEEDS THE IS BIT IN THE PSL
                                       ;3191   ;       AND THE LOAD SIGNAL ON THE IS BIT, ON THE CEH MODULE.
                                       ;3192   ;
                                       ;3193   ; ERROR DESCRIPTION
                                       ;3194   ;       DATA: EXPECTED IS BIT
                                       ;3195   ;             RECEIVED IS BIT
                                       ;3196   ;             LOOP COUNT -- 2= IS BIT SHOULD BE 0, 1= IS BIT SHOULD BE 1
                                       ;3197   ;
                                       ;3198   ; SYNC POINT DESCRIPTION
                                       ;3199   ;       ADDRESS SYNC1A--IS BIT GETS LOADED
                                       ;3200   ;--
                                       ;3201   ;*************************************************************************
                                       ;3202   =0
U 10FA, 0018,0039,0D80,09F8,0000,1175  ;3203   T15C:   NEWTST[.3]
U 10FB, 0003,003C,0180,09F0,0000,12DE  ;3204           RC[0E]_0                        ; INIT EXPECTED VALUE OF IS BIT
U 12DE, 0818,0038,1180,0800,0000,12DF  ;3205           D_K[.4]                         ; GENERATE MASK OF IS BIT
U 12DF, 0B00,003C,0180,0800,0000,12E0  ;3206           D_D.SWAP
U 12E0, 0001,003C,0180,0A80,0000,12E1  ;3207           R[0]_D                          ; SAVE
U 12E1, 0001,003C,0180,0A88,0000,12E2  ;3208           R[1]_D                          ;
                                       ;3209
                                       ;3210   ;//////////////////////////////////////////////////////////////////////////
                                       ;3211
                                       ;3212   ;+
                                       ;3213   ; CHECK THE IS BIT
                                       ;3214   ;-
                                       ;3215
U 12E2, 0018,0038,0980,09E0,0000,10FC  ;3216           RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 10FC, 0000,003D,0180,0800,0000,1189  ;3217   =0      ERLOOP
U 10FD, 0810,0038,0180,0970,0000,12E3  ;3218   T15CL1: D_RC[0E]                        ; GET THE EXPECTED VALUE
U 12E3, 0000,003C,3D80,3C00,0000,12E4  ;3219           ID[PSL]_D                       ; LOAD THE IS BIT
U 12E4, 0800,003C,0180,0A00,0000,12E5  ;3220           D_R[0]                          ; GET THE ID BUS DATA
U 12E5, 0000,003C,0180,3C00,8000,12E6  ;3221   SYNC1A: ID[IBUF]_D,INTRPT.ACK           ; EXECUTE THE TEST
U 12E6, 0810,0038,3DF0,2D70,0000,12E7  ;3222           Q_ID[PSL],D_RC[0E]              ; READ THE IS BIT
U 12E7, 001C,0034,01C0,0A08,0000,12E8  ;3223           Q_Q.AND.R[1]                    ; MASK
U 12E8, 001D,2000,0180,0800,0010,12E9  ;3224           A[U_Q-D,CLK.UBCC                ; CHECK
U 12E9, 0000,013C,0180,0800,0000,10FE  ;3225           Z?
U 10FE, 0001,203D,0180,09E8,0000,118C  ;3226   =0      ERROR2,RC[0D]_Q                 ; IS BIT FAILED
U 10FF, 0000,003C,0180,0A00,0000,12EA  ;3227           LAB_R[0]                        ; GET THE ID BUS DATA
U 12EA, 0000,003C,0180,09F0,0000,12EB  ;3228           RC[0E]_LA                       ; SET THE EXPECTED DATA
U 12EB, 0003,003C,0180,0A80,0000,12EC  ;3229           R[0]_0                          ; SET THE ID BUS DATA
U 12EC, 0810,0038,0180,0960,0000,12ED  ;3230           D_RC[0C]
U 12ED, 0019,8000,0580,09E0,0010,12EE  ;3231           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
U 12EE, 0000,013C,0180,0800,0000,110A  ;3232           Z?
U 110A, 0000,003C,0180,0800,0000,10FD  ;3233   =0      J/T15CL1                        ; CONTINUE
U 110B, 0000,003C,0180,0800,0000,1110  ;3234           NOP
```

```
                                        ;3235
                                        ;3236
                                        ;3237
```

```
;

;L

U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
U
```

```
                                            ;3238   .PAGE   "TEST 15D       PSL TRAP PENDING (TP) BIT"
                                            ;3239   ;*************************************************************************
                                            ;3240   ;++
                                            ;3241   ; TEST  15D     PSL TRAP PENDING (TP) BIT
                                            ;3242   ;
                                            ;3243   ; TEST DESCRIPTION
                                            ;3244   ;       THIS TEST CHECKS THE PSL TP BIT.
                                            ;3245   ;
                                            ;3246   ;       SUBTST 1 - CHECK THAT THE PSL TP IS LOADED FROM ITSELF DURING
                                            ;3247   ;                  AN "IRD STATE" FUNCTION AND AN INSTRUCTION BUFFER STALL.
                                            ;3248   ;       SUBTST 2 - CHECK THAT THE PSL TP BIT GETS THE PSL T BIT DURING AN
                                            ;3249   ;                  IRD STATE FUNCTION AND NO INSTRUCTION BUFFER STALL
                                            ;3250   ;       SUBTST 3 - CHECK THAT THE PSL TP BIT GETS ID BUS BIT 30 DURING
                                            ;3251   ;                  AN INTERRUPT ACKNOWLEDGE.
                                            ;3252   ;       SUBTST 4 - CHECK THAT THE PSL TP BIT GETS ID BUS BIT 30 DURING
                                            ;3253   ;                  AN EXCEPTION ACKNOWLEDGE.
                                            ;3254   ;
                                            ;3255   ; LOGIC DESCRIPTION
                                            ;3256   ;       THIS TEST CHECKS THE SELECT ~~LINES ON~~ THE MULTIPLEXOR THAT FEEDS
                                            ;3257   ;       THE PSL TP BIT ON THE ICL MODULE.
                                            ;3258   ;
                                            ;3259   ; ERROR DESCRIPTION
                                            ;3260   ;       DATA: EXPECTED TP BIT
                                            ;3261   ;             RECEIVED TP BIT
                                            ;3262   ;             LOOP COUNT -- 2= PSL TP SHOULD BE 0, 1= PSL TP CHOULD BE 1
                                            ;3263   ;
                                            ;3264   ; SYNC POINT DESCRIPTION
                                            ;3265   ;       SUBTST 1 - SYNC1B--LOAD THE TP BIT FROM ITSELF
                                            ;3266   ;       SUBTST 2 - SYNC1C--LOAD THE TP BIT FROM THE PSL T BIT
                                            ;3267   ;       SUBTST 3 - SYNC1D--LOAD THE TP BIT FROM ID BUS BIT 30
                                            ;3268   ;       SUBTST 4 - SYNC1E--LOAD THE TP BIT FROM ID BUS BIT 30
                                            ;3269   ;--
                                            ;3270   ;************************************************************************
                                            ;3271   =0
U 1110, 0018,0039,0D80,09F8,0000,1175       ;3272   T15D:   NEWTST[.3]
U 1111, 0018,0038,6580,0A80,0000,12EF       ;3273           R[0]_K[.10]                     ; INIT THE PSL DATA
U 12EF, 0818,0038,3180,0800,0000,12F0       ;3274           D_K[.40]                        ; GENERATE THE ID BUS DATA
U 12F0, 0800,003C,0180,0800,0000,12F1       ;3275           D_D.SWAP
U 12F1, 0001,003C,0180,0A88,0000,12F2       ;3276           R[1]_D                          ; EQUALS 40000000
U 12F2, 0001,003C,0180,0A90,0000,12F3       ;3277           R[2]_D                          ; SAVE AS A MASK
U 12F3, 0003,003C,0180,09F0,0000,1112       ;3278           RC[0E]_0                        ; INIT THE EXPECTED DATA
                                            ;3279
                                            ;3280   ;////////////////////////////////////////////////////////////////////////
                                            ;3281
                                            ;3282   ;+
                                            ;3283   ; PSL TP_PSL TP=> -IACK*-EACK*-ID TO PSL*IRD STATE*(STALL+SVC)
                                            ;3284   ;-
                                            ;3285
                                            ;3286   =0
U 1112, 0000,003D,0180,0800,0000,11A3       ;3287   T15DS1: SUBTEST
U 1113, 2018,0038,0980,09E0,0000,1114       ;3288           RC[0C]_K[.2],IBC/FLUSH          ; SET LOOP COUNT AND INIT IB
U 1114, 0000,003D,0180,0800,0000,1189       ;3289   =0      ERLOOP
U 1115, 0800,003C,0180,0A00,0000,12F4       ;3290   T15DL1: D_R[0]                          ; INIT THE PSL
U 12F4, 0000,003C,3D80,3C00,0000,12F5       ;3291           ID[PSL]_D                       ; ...
U 12F5, 0800,003C,0180,0A08,0000,12F6       ;3292           D_R[1]                          ; GET ID BUS DATA
```

```
U 12F6, 0000,003C,0180,3C00,1000,12F7   ;3293   SYNC1B: ID[IBUF]_D,MSC/IRD               ; EXECUTE THE TEST
U 12F7, 0810,0038,3DF0,2D70,0000,12F8   ;3294           Q_ID[PSL],D_RC[OE]               ; READ THE PSL
U 12F8, 001C,0034,01C0,0A10,0000,12F9   ;3295           Q_Q.AND.R[2]                     ; MASK
U 12F9, 001D,2000,0180,0800,0010,12FA   ;3296           A[U_Q-D,CLK.UBCC                 ; CHECK
U 12FA, 0000,013C,0180,0800,0000,1116   ;3297           Z?
U 1116, 0001,203D,0180,09E8,0000,118C   ;3298   =0      ERROR2,RC[0D]_Q                  ; PSL TP FAILED
U 1117, 0000,003C,0180,0A08,0000,12FB   ;3299           LAB_R[1]                         ; GET DATA WITH TP ON
U 12FB, 0000,003C,0180,0A80,0000,12FC   ;3300           R[0]_LA                          ; SET PSL DATA
U 12FC, 0000,003C,0180,09F0,0000,12FD   ;3301           RC[0E]_LA                        ; SET EXPECTED DATA
U 12FD, 0003,003C,0180,0A88,0000,12FE   ;3302           R[1]_0                           ; SET ID BUS DATA
U 12FE, 0810,0038,0180,0960,0000,12FF   ;3303           D_RC[OC]
U 12FF, 0019,8000,0580,09E0,0010,1300   ;3304           RC[OC]_D-K[.1],CLK.UBCC,BYTE     ; CHECK THE LOOP COUNT
U 1300, 0000,013C,0180,0800,0000,1118   ;3305           Z?
U 1118, 0000,003C,0180,0800,0000,1115   ;3306   =0      J/T15DL1                         ; CONTINUE
                                        ;3307
                                        ;3308
                                        ;3309   ;////////////////////////////////////////////////////////////////////
                                        ;3310
                                        ;3311   ;+
                                        ;3312   ; PSL TP_PSL T=> -IACK*-EACK*-ID TO PSL*IRD STATE*-(STALL+SVC)
                                        ;3313   ;-
                                        ;3314
U 1119, 0000,003C,0180,0A10,0000,1301   ;3315   T15DS2: LAB_R[2]
U 1301, 0000,003C,0180,0A80,0000,111A   ;3316           R[0]_LA                          ; INIT THE PSL DATA
U 111A, 0000,003D,0180,0800,0000,11A3   ;3317   =0      SUBTEST
U 111B, 0000,003C,0180,0A88,0000,1302   ;3318           R[1]_LA                          ; INIT THE ID BUS DATA
U 1302, 0003,003C,0180,09F0,0000,111C   ;3319           RC[OE]_0                         ; INIT THE EXPECTED DATA
U 111C, 2018,0039,1180,0800,4200,11AB   ;3320   =0      ALU_K[.4],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 111D, D018,0038,0980,09E0,0000,111E   ;3321           RC[OC]_K[.2],IBC/CLR.1           ; SET THE LOOP COUNT & GET OUT OF EP1
U 111E, 0000,003D,0180,0800,0000,1189   ;3322   =0      ERLOOP
U 111F, 0800,003C,0180,0A00,0000,1303   ;3323   T15DL2: D_R[0]                           ; INIT THE PSL
U 1303, 0000,003C,3D80,3C00,0000,1304   ;3324           ID[PSL]_D
U 1304, 0800,003C,0180,0A08,0000,1305   ;3325           D_R[1]                           ; GET THE ID BUS DATA
U 1305, 0000,003C,0180,3C00,1000,1306   ;3326   SYNC1C: ID[IBUF]_D,MSC/IRD               ; EXECUTE THE TEST
U 1306, 0810,0038,3DF0,2D70,0000,1307   ;3327           Q_ID[PSL],D_RC[OE]               ; GET THE PSL
U 1307, 001C,0034,01C0,0A10,0000,1309   ;3328           Q_Q.AND.R[2]                     ; MASK
U 1309, 001D,2000,0180,0800,0010,130A   ;3329           A[U_Q-D,CLK.UBCC                 ; CHECK
U 130A, 0000,013C,0180,0800,0000,1120   ;3330           Z?
U 1120, 0001,203D,0180,09E8,0000,118C   ;3331   =0      ERROR2,RC[0D]_Q                  ; PSL TP INCORRECT
U 1121, 0018,0038,6580,0A80,0000,130B   ;3332           R[0]_K[.10]                      ; INIT ThE PSL DATA
U 130B, 0003,003C,0180,0A88,0000,130C   ;3333           R[1]_0                           ; INIT THE ID BUS DATA
U 130C, 0000,003C,0180,0A10,0000,130D   ;3334           LAB_R[2]
U 130D, 0000,003C,0180,09F0,0000,130E   ;3335           RC[OE]_LA                        ; INIT HTE EXPECTED DATA
U 130E, 0810,0038,0180,0960,0000,130F   ;3336           D_RC[OC]
U 130F, 0019,8000,0580,09E0,0010,1310   ;3337           RC[OC]_D-K[.1],CLK.UBCC,BYTE     ; CHECK THE LOOP COUNT
U 1310, 0000,013C,0180,0800,0000,1122   ;3338           Z?
U 1122, 0000,003C,0180,0800,0000,111F   ;3339   =0      J/T15DL2                         ; CONTINUE
                                        ;3340
                                        ;3341
                                        ;3342   ;////////////////////////////////////////////////////////////////////
                                        ;3343
                                        ;3344   ;+
                                        ;3345   ; PSL TP_ID 30=> IACK*-ID TO PSL*IRD STATE*-(STALL+SVC)
                                        ;3346   ;-
                                        ;3347
```

```
U 1123, 0000,003C,6580,0A10,0000,1311   ;3348   T15DS3: LAB_R[2],KMX/.10
U 1311, 0018,0014,6580,0A80,0000,1124   ;3349           R[0]_LA+K[.10]                  ; INIT THE PSL DATA
U 1124, 0000,003D,0180,0800,0000,11A3   ;3350   =0      SUBTEST
U 1125, 0003,003C,0180,09F0,0000,1312   ;3351           RC[0E]_0                        ; INIT THE EXPECTED DATA
U 1312, 0003,003C,0180,0A88,0000,1313   ;3352           R[1]_0                          ; INIT ID BUS DATA
                                        ;3353
U 1313, 0018,0038,0980,09E0,0000,1126   ;3354           RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 1126, 0000,003D,0180,0800,0000,1189   ;3355   =0      ERLOOP
U 1127, 0800,003C,0180,0A00,0000,1314   ;3356   T15DL3: D_R[0]
U 1314, 0000,003C,3D80,3C00,0000,1315   ;3357           ID[PSL]_D                       ; INIT THE PSL
U 1315, 0800,003C,0180,0A08,0000,1316   ;3358           D_R[1]                          ; GET THE ID BUS DATA
U 1316, 0000,003C,0180,3C00,9000,1317   ;3359   SYNC1D: ID[IBUF]_D,MSC/IRD,INTRPT.ACK   ; EXECUTE THE TEST
U 1317, 0810,0038,3DF0,2D70,0000,1318   ;3360           Q_ID[PSL],D_RC[0E]              ; GET THE PSL
U 1318, 001C,0034,01C0,0A10,0000,1319   ;3361           Q_Q.AND.R[2]                    ; MASK
U 1319, 001D,2000,0180,0800,0010,131A   ;3362           ALU_Q-D,CLK.UBCC                ; CHECK
U 131A, 0000,013C,0180,0800,0000,1128   ;3363           Z?
U 1128, 0001,203D,0180,09E8,0000,118C   ;3364   =0      ERROR2,RC[0D]_Q                 ; TP BIT FAILED
U 1129, 0000,003C,0180,0A10,0000,131B   ;3365           LAB_R[2]
U 131B, 0000,003C,0180,09F0,0000,131C   ;3366           RC[0E]_LA                       ; SET TEH EXPECTED DATA
U 131C, 0000,003C,0180,0A88,0000,131D   ;3367           R[1]_LA                         ; SET THE ID BUS DATA
U 131D, 0003,003C,0180,0A80,0000,131E   ;3368           R[0]_0                          ; SET THE PSL DATA
U 131E, 0810,0038,0180,0960,0000,131F   ;3369           D_RC[0C]
U 131F, 0019,8000,0580,09E0,0010,1320   ;3370           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
U 1320, 0000,013C,0180,0800,0000,112A   ;3371           Z?
U 112A, 0000,003C,0180,0800,0000,1127   ;3372   =0      J/T15DL3                        ; CONTINUE
                                        ;3373
                                        ;3374   ;//////////////////////////////////////////////////////////////////////
                                        ;3375
                                        ;3376   ;+
                                        ;3377   ; PSL TP_ID 30=> EACK*-ID TO PSL*IRD STATE*-(STALL+SVC)
                                        ;3378   ;-
                                        ;3379
U 112B, 0000,003C,6580,0A10,0000,1321   ;3380   T15DS4: LAB_R[2],KMX/.10
U 1321, 0018,0014,6580,0A80,0000,112C   ;3381           R[0]_LA+K[.10]                  ; INIT THE PSL DATA
U 112C, 0000,003D,0180,0800,0000,11A3   ;3382   =0      SUBTEST
U 112D, 0003,003C,0180,09F0,0000,1322   ;3383           RC[0E]_0                        ; INIT THE EXPECTED DATA
U 1322, 0003,003C,0180,0A88,0000,1323   ;3384           R[1]_0                          ; INIT ID BUS DATA
                                        ;3385
U 1323, 0018,0038,0980,09E0,0000,112E   ;3386           RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 112E, 0000,003D,0180,0800,0000,1189   ;3387   =0      ERLOOP
U 112F, 0800,003C,0180,0A00,0000,1324   ;3388   T15DL4: D_R[0]
U 1324, 0000,003C,3D80,3C00,0000,1325   ;3389           ID[PSL]_D                       ; INIT THE PSL
U 1325, 0800,003C,0180,0A08,0000,1326   ;3390           D_R[1]                          ; GET THE ID BUS DATA
U 1326, 0000,003C,0180,3C00,D000,1327   ;3391   SYNC1E: ID[IBUF]_D,MSC/IRD,EXCEPT.ACK   ; EXECUTE THE TEST
U 1327, 0810,0038,3DF0,2D70,0000,1328   ;3392           Q_ID[PSL],D_RC[0E]              ; GET THE PSL
U 1328, 001C,0034,01C0,0A10,0000,1329   ;3393           Q_Q.AND.R[2]                    ; MASK
U 1329, 001D,2000,0180,0800,0010,132A   ;3394           ALU_Q-D,CLK.UBCC                ; CHECK
U 132A, 0000,013C,0180,0800,0000,1130   ;3395           Z?
U 1130, 0001,203D,0180,09E8,0000,118C   ;3396   =0      ERROR2,RC[0D]_Q                 ; TP BIT FAILED
U 1131, 0000,003C,0180,0A10,0000,132B   ;3397           LAB_R[2]
U 132B, 0000,003C,0180,09F0,0000,132C   ;3398           RC[0E]_LA                       ; SET TEH EXPECTED DATA
U 132C, 0000,003C,0180,0A88,0000,132D   ;3399           R[1]_LA                         ; SET THE ID BUS DATA
U 132D, 0003,003C,0180,0A80,0000,132E   ;3400           R[0]_0                          ; SET THE PSL DATA
U 132E, 0810,0038,0180,0960,0000,132F   ;3401           D_RC[0C]
U 132F, 0019,8000,0580,09E0,0010,1330   ;3402           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
```

```
U 1330, 0000,013C,0180,0800,0000,1132   ;3403           Z?
U 1132, 0000,003C,0180,0800,0000,112F   ;3404   =0      J/T15DL4                        ; CONTINUE
U 1133, 0000,003C,0180,0800,0000,1134   ;3405           NOP
                                        ;3406
```

```
                                           .PAGE   "TEST 15E       PSL BITS THAT ARE A FUNCTION OF 'LOAD FPD'"
                                           ;*************************************************************************
                                           ;++
                                           ; TEST  15E     PSL BITS THAT ARE A FUNCTION OF "LOAD FPD"
                                           ;
                                           ; TEST DESCRIPTION
                                           ;       THIS TEST CHECKS THOSE BITS OF THE PSL THAT GET LOADED WHEN A
                                           ;       "LOAD FPD" FUNCTION IS EXECUTED.
                                           ;
                                           ;       SUBTST 1 - CHECK THAT THE FPD BIT SETS, INDEPENDENT OF THE ID BUS,
                                           ;                  WHEN A "SET FPD" FUNCTION IS EXECUTED.
                                           ;       SUBTST 2 - CHECK THAT THE COMPATABILITY MODE AND CURRENT MODE BITS
                                           ;                  REMAIN UNCHANGED AND THAT THE FPD BIT CLEARS ON A "CLR FPD"
                                           ;                  FUNCTION.
                                           ;       SUBTST 3 - THECK THAT THE FPD AND COMPATABILITY MODE BITS CLEAR
                                           ;                  WHEN EXECUTING A "SET FPD" AND "EXCEPTION ACKNOWLEDGE"
                                           ;                  FUNCTION SIMULTANEOUSLY.
                                           ;
                                           ; LOGIC DESCRIPTION
                                           ;       THIS TEST CHECKS THE LOGIC ON THE CEH MODULE THAT LOADS THE
                                           ;       FPD, CM, AND CUR MODE BITS DURING THE EXECUTION OF A SET OR CLR FPD
                                           ;       FUNCTION. ("LOAD FPD" IS ASSERTED)
                                           ;
                                           ; ERROR DESCRIPTION
                                           ;       DATA: EXPECTED PSL
                                           ;             RECEIVED PSL
                                           ;
                                           ; SYNC POINT DESCRIPTION
                                           ;       SUBTST 1 - SYNC1F--EXECUTE THE "LOAD FPD"
                                           ;       SUBTST 2 - SYNC20--EXECUTE THE "LOAD FPD"
                                           ;       SUBTST 3 - SYNC21--EXECUTE THE "LOAD FPD" AND EXCEPTION ACK.
                                           ;--
                                           ;************************************************************************
                                           =0
U 1134, 0018,0039,0980,09F8,0000,1175      T15E:   NEWTST[.2]
U 1135, 0818,0038,C580,0800,0000,1331              D_K[.88]                        ; GENERATE A MASK OF THE BITS
U 1331, 0819,0014,0D80,0800,0000,1332              D_D+K[.3]                       ; D EQUALS 8B
U 1332, 0800,003C,0180,0800,0000,1333              D_D.SWAP                        ; EQUALS 8B000000
U 1333, 0001,003C,0180,0A90,0000,1334              R[2]_D                          ; SAVE
U 1334, 0003,003C,0180,0A80,0000,1335              R[0]_0                          ; INIT INITIAL VALUE OF PSL
U 1335, 0001,003C,0180,0A88,0000,1336              R[1]_D                          ; SAVE AS ID BUS DATA
U 1336, 0818,0038,0180,0800,0000,1337              D_K[.8]                         ; GENERATE THE EXPECTED DATA
U 1337, 0800,003C,0180,0800,0000,1338              D_D.SWAP                        ; D EQUALS 08000000
U 1338, 0001,003C,0180,09F0,0000,1136              RC[0E]_D                        ; SAVE

                                           ;///////////////////////////////////////////////////////////////////////

                                           ;+
                                           ; FIRST CHECK THAT "SET FPD" SETS THE FPD BIT
                                           ;-

                                           =0
U 1136, 0000,003D,0180,0800,0000,11A3      T15ES1: SUBTEST
U 1137, 0000,003C,0180,0800,0000,1138              NOP
U 1138, 0000,003D,0180,0800,0000,1189      =0      ERLOOP
```

```
U 1139, 0800,003C,0180,0A00,0000,1339   ;3462           D_R[0]                          ; INIT THE PSL
U 1339, 0000,003C,3D80,3C00,0000,133A   ;3463           ID[PSL]_D
U 133A, 0800,003C,0180,0A08,0000,133B   ;3464           D_R[1]                          ; GET ID BUS DATA
U 133B, 0000,003C,0180,3C00,2400,133D   ;3465   SYNC1F: ID[IBUF]_D,MSC/SET.FPD          ; EXECUTE THE TEST
U 133D, 0810,0038,3DF0,2D70,0000,133E   ;3466           Q_ID[PSL],D_RC[0E]              ; GET THE PSL
U 133E, 001C,0034,01C0,0A10,0000,133F   ;3467           Q_Q.AND.R[2]                    ; MASK
U 133F, 001D,2000,0180,0800,0010,1340   ;3468           A[U_Q-D,CLK.UBCC                ; CHECK
U 1340, 0000,013C,0180,0800,0000,113A   ;3469           Z?
U 113A, 0001,203D,0180,09E8,0000,118C   ;3470   =0      ERROR2,RC[0D]_Q                 ; SET FPD FAILED ON A BIT
                                        ;3471
                                        ;3472   ;///////////////////////////////////////////////////////////////////////
                                        ;3473
                                        ;3474   ;+
                                        ;3475   ; NOW CHECK THE ''CLR FPD'' FUNCTION
                                        ;3476   ;-
                                        ;3477
U 113B, 0000,003C,0180,0A10,0000,1341   ;3478   T15ES2: LAB_R[2]
U 1341, 0000,003C,0180,0A80,0000,113C   ;3479           R[0]_LA                         ; INIT THE PSL DATA
U 113C, 0000,003D,0180,0800,0000,11A3   ;3480   =0      SUBTEST
U 113D, 0003,003C,0180,0A88,0000,1342   ;3481           R[1]_0                          ; INIT THE ID BUS DATA
U 1342, 0818,0038,4180,0800,0000,1343   ;3482           D_K[.80]
U 1343, 0819,0014,0D80,0800,0000,1344   ;3483           D_D+K[.3]                       ; GENERATE THE EXPECTED DATA
U 1344, 0800,003C,0180,0800,0000,1345   ;3484           D_D.SWAP
U 1345, 0001,003C,0180,09F0,0000,113E   ;3485           RC[0E]_D                        ; EQUALS 83000000
U 113E, 0000,003D,0180,0800,0000,1189   ;3486   =0      ERLOOP
U 113F, 0800,003C,0180,0A00,0000,1346   ;3487           D_R[0]
U 1346, 0000,003C,3D80,3C00,0000,1347   ;3488           ID[PSL]_D                       ; INIT THE PSL
U 1347, 0800,003C,0180,0A08,0000,1348   ;3489           D_R[1]                          ; GET ID BUS DATA
U 1348, 0000,003C,0180,3C00,2000,1349   ;3490   SYNC20: ID[IBUF]_D,MSC/CLR.FPD          ; EXECUTE THE TEST
U 1349, 0810,0038,3DF0,2D70,0000,134A   ;3491           Q_ID[PSL],D_RC[0E]              ; READ THE PSL
U 134A, 001C,0034,01C0,0A10,0000,134B   ;3492           Q_Q.AND.R[2]                    ; MASK
U 134B, 001D,2000,0180,0800,0010,134C   ;3493           A[U_Q-D,CLK.UBCC                ; MASK
U 134C, 0000,013C,0180,0800,0000,1140   ;3494           Z?
U 1140, 0001,203D,0180,09E8,0000,118C   ;3495   =0      ERROR2,RC[0D]_Q                 ; A BIT FILAED IN THE PSL
                                        ;3496
                                        ;3497   ;///////////////////////////////////////////////////////////////////////
                                        ;3498
                                        ;3499   ;+
                                        ;3500   ; NOW CHECK THE ''LOAD FPD'' WITH EXCEPTION ACK
                                        ;3501   ;-
                                        ;3502
U 1141, 0000,003C,0180,0A10,0000,134D   ;3503   T15ES3: LAB_R[2]
U 134D, 0000,003C,0180,0A80,0000,1142   ;3504           R[0]_LA                         ; INIT THE PSL DATA
U 1142, 0000,003D,0180,0800,0000,11A3   ;3505   =0      SUBTEST
U 1143, 0000,003C,0180,0A88,0000,134E   ;3506           R[1]_LA                         ; INIT THE ID BUS DATA
U 134E, 0003,003C,0180,09F0,0000,1144   ;3507           RC[0E]_0                        ; INIT THE EXPECTED DATA
U 1144, 0000,003D,0180,0800,0000,1189   ;3508   =0      ERLOOP
U 1145, 0800,003C,0180,0A00,0000,1350   ;3509           D_R[0]
U 1350, 0000,003C,3D80,3C00,0000,1351   ;3510           ID[PSL]_D                       ; INIT THE PSL
U 1351, 0800,003C,0180,0A08,0000,1352   ;3511           D_R[1]                          ; GET THE ID BUS DATA
U 1352, 0000,003C,0180,3C00,E400,1354   ;3512   SYNC21: ID[IBUF]_D,MSC/SET.FPD,EXCEPT.ACK ; EXECUTE THE TEST
U 1354, 0810,0038,3DF0,2D70,0000,1355   ;3513           Q_ID[PSL],D_RC[0E]              ; GET THE PSL
U 1355, 001C,0034,01C0,0A10,0000,1356   ;3514           Q_Q.AND.R[2]                    ; MASK
U 1356, 001D,2000,0180,0800,0010,1357   ;3515           A[U_Q-D,CLK.UBCC                ; MASK
U 1357, 0000,013C,0180,0800,0000,1146   ;3516           Z?
```

```
U 1146, 0001,203D,0180,09E8,0000,118C   ;3517   =0      ERROR2,RC[OD]_Q                          ; BIT IN PSL DID NOT CLEAR
U 1147, 0000,003C,0180,0800,0000,1148   ;3518           NOP
                                        ;3519
                                        ;3520
                                        ;3521
```

```
                                                .PAGE   "TEST 15F       VECTOR REGISTER DATA INTEGRITY BITS <31:16>"
                                                ;************************************************************************
                                                ;++
                                                ; TEST  15F     VECTOR REGISTER DATA INTEGRITY BITS <31:16>
                                                ;
                                                ; TEST DESCRIPTION
                                                ;       THIS TEST CHECKS THE DATA INTEGRITY AND THE PRIORITY ENCODE FUNCTION
                                                ;       OF THE VECTOR REGISTER BITS <31:16>.
                                                ;
                                                ;       SUBTST 1 - FILL BITS <31:16> WITH ONES AND CHECK THAT THE ''NUMBER
                                                ;                  OF ONES'' BITS (<20:16>), ARE CORRECT. THE TEST PATTERN
                                                ;                  IS AS FOLLOWS: 00000000, 00010000, 00030000, 00070000,
                                                ;                  000F0000, 001F0000, 003F0000, 007F0000,  .....,
                                                ;                  FFFF0000.
                                                ;       SUBTST 2 - FLOAT A ONE THRU BITS <31:15> OF THE VECTOR REGISTER
                                                ;                  AND CHECK THAT THE PRIORITY BITS (<24:21>) ARE CORRECT.
                                                ;
                                                ; LOGIC DESCRIPTION
                                                ;       THIS TEST CHECKS THE LOGIC ON THE CEK MODULE THAT GENERATES THE
                                                ;       UPPER 16 BITS OF THE VECTOR REGISTER, I.E. THE ''NUMBER OF ONES''
                                                ;       CIRCUIT AND THE ''PRIORITY'' CIRCUIT. IT ALSO CHECKS THE ID BUS INTERFACE
                                                ;       TO THE VECTOR REGISTER.
                                                ;
                                                ; ERROR DESCRIPTION
                                                ;       DATA: EXPECTED CONTENTS OF THE VECTOR REGISTER
                                                ;             RECEIVED CONTENTS OF THE VECTOR REGISTER
                                                ;             LOOP COUNT
                                                ;                SUBTST 1 - INDICATES THE NUMBER OF ONES BEING LOADED INTO
                                                ;                           THE VECTOR REGISTER, I.E. 11=0, 10=1, F=2,
                                                ;                           E=3, D=4, C=5, ETC.
                                                ;                SUBTST 2 - INDICATES THE BIT POSITION OF THE FLOATING ONE,
                                                ;                           I.E. 11= BIT 15, 10= BIT 16, F= BIT 17, E= BIT 18, ETC.
                                                ;
                                                ; SYNC POINT DESCRIPTION
                                                ;       SUBTST 1 - SYNC22--VECTOR REGISTER GETS LOADED WITH THE TEST PATTERN
                                                ;                  SYNC23--VECTOR REGISTER IS READ ON THE ID BUS
                                                ;       SUBTST 2 - SYNC24--VECTOR REGISTER IS LOADED WITH THE TEST PATTERN
                                                ;                  SYNC25--VECTOR REGISTER IS READ ON THE ID BUS
                                                ;--
                                                ;*********************************************************************
                                                =0
U 1148, 0018,0039,0D80,09F8,0000,1175           T15F:   NEWTST[.3]
U 1149, 0818,0038,4580,0800,0000,1358                   D_K[.8000]                      ; SET INPUT GENERATOR VALUE
U 1358, 0501,003C,0180,0A80,0000,1359                   R[0]_D,D_D.LEFT                 ; SAVE AND SET EXPECTED INCREMENT VALUE
U 1359, 0001,003C,0180,0A90,0000,135A                   R[2]_D                          ; SAVE
U 135A, 0818,0038,C180,0800,0000,135B                   D_K[.FFFF]                      ; GENERATE A MASK
U 135B, 0B00,003C,0180,0800,0000,135C                   D_D.SWAP
U 135C, 0001,003C,0180,0A88,0000,135D                   R[1]_D                          ; SAVE IN R1
U 135D, 0003,003C,0180,09F0,0000,135E                   RC[0E]_0                        ; INITIALIZE EXPECTED VALUE
U 135E, 0003,003C,0180,0A98,0000,114A                   R[3]_0                          ; INITIALIZE ID BUS DATA

                                                ;/////////////////////////////////////////////////////////////////////

                                                ;+
                                                ; FIRST CHECK THE NUMBER OF ONES CIRCUIT
```

```
                                       ;3577   ;-
                                       ;3578
                                       ;3579   =0
U 114A, 0000,003D,0180,0800,0000,11A3  ;3580   T15FS1: SUBTEST
U 114B, 0818,0038,2180,0800,0000,135F  ;3581           D_K[.14]                        ; GENERATE A LOOP COUNT
U 135F, 0019,0000,0D80,09E0,0000,114C  ;3582           RC[0C]_D-K[.3]                  ; EQUALS 11(16)
U 114C, 0000,003D,0180,0800,0000,1189  ;3583   =0      ERLOOP
U 114D, 0F00,003C,0180,0800,0000,1360  ;3584   T15FL1: D_0
U 1360, 0000,003C,3580,3C00,0000,1361  ;3585           ID[VECTOR]_D                    ; INITIALIZE THE VECTOR REGISTER
U 1361, 0800,003C,0180,0A18,0000,1362  ;3586           D_R[3]                          ; GET THE TEST PATTERN
U 1362, 0000,003C,3580,3C00,0000,1363  ;3587   SYNC22: ID[VECTOR]_D                    ; EXECUTE THE TEST
U 1363, 0810,0038,35F0,2D70,0000,1364  ;3588   SYNC23: Q_ID[VECTOR],D_RC[0E]           ; READ THE VECTOR REGISTER
U 1364, 001C,0034,01C0,0A08,0000,1365  ;3589           Q_Q.AND.R[1]                    ; MASK
U 1365, 001D,2000,0180,0800,0010,1366  ;3590           A[U_Q-D,CLK.UBCC                ; CHECK
U 1366, 0000,013C,0180,0800,0000,114E  ;3591           Z?
U 114E, 0001,203D,0180,09E8,0000,118C  ;3592   =0      ERROR2,RC[0D]_Q                 ; VECTOR REGISTER FAILED
                                       ;3593
                                       ;3594   ;+
                                       ;3595   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                       ;3596   ;-
                                       ;3597
U 114F, 0818,0038,0980,0800,0000,1367  ;3598           D_K[.2]                         ; INSERT THE PRIORITY VALID BIT
U 1367, 0B00,003C,0180,0800,0000,1368  ;3599           D_D.SWAP                        ; INTO THE EXPECTED DATA
U 1368, 0811,0030,0180,0970,0000,1369  ;3600           D_D.OR.RC[0E]                   ; ...
U 1369, 0000,003C,0180,0A10,0000,136A  ;3601           LAB_R[2]                        ; GET THE INCREMENT VALUE FOR THE EXPECTED D
U 136A, 001C,2014,0180,09F0,0000,136B  ;3602           RC[0E]_LA+D                     ; SET THE NEXT EXPECTED VALUE
U 136B, 0800,003C,0180,0A18,0000,136C  ;3603           D_R[3]                          ; GET THE ID BUS GENERATOR VALUE
U 136C, 0000,003C,0180,0A00,0000,136D  ;3604           LAB_R[0]                        ; GET THE ID BUS DATA
U 136D, 083C,2014,0180,0800,0000,136E  ;3605           D_A[U.LEFT,ALU_LA[A+B]D         ; GENERATE NEXT VALUE OF ID BUS DATA
U 136E, 0001,003C,0180,0A98,0000,136F  ;3606           R[3]_D                          ; SAVE
U 136F, 0810,0038,0180,0960,0000,1370  ;3607           D_RC[0C]
U 1370, 0019,8000,0580,09E0,0010,1371  ;3608           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT THE LOOP COUNT
U 1371, 0000,013C,0180,0800,0000,1150  ;3609           Z?
U 1150, 0000,003C,0180,0800,0000,114D  ;3610   =0      J/T15FL1                        ; CONTINUE
                                       ;3611
                                       ;3612
                                       ;3613   ;///////////////////////////////////////////////////////////////////////
                                       ;3614
                                       ;3615   ;+
                                       ;3616   ; NOW CHECK THE PRIORITY BITS
                                       ;3617   ;-
                                       ;3618
U 1151, 0018,0038,4580,0A98,0000,1372  ;3619   T15FS2: R[3]_K[.8000]                   ; SET THE INITIAL ID BUS DATA
U 1372, 0000,003C,01F8,0800,0084,7152  ;3620           SC_K[.8],Q_0
U 1152, 0000,003D,0180,0800,0000,11A3  ;3621   =0      SUBTEST
U 1153, 0818,0038,0580,0800,0000,1373  ;3622           D_K[.1]                         ; GENERATE THE INITIAL EXPECTED VALUE
U 1373, 0D00,003C,0180,0800,0000,1374  ;3623           D_DAL.SC                        ; D EQUALS 100
U 1374, 0819,0014,0980,0800,0000,1375  ;3624           D_D+K[.2]                       ; D EQUALS 102
U 1375, 0B00,003C,0180,0800,0000,1376  ;3625           D_D.SWAP                        ; D EQUALS 02010000
U 1376, 0001,003C,0180,0AA8,0000,1377  ;3626           R[5]_D                          ; SAVE
U 1377, 0003,003C,0180,09F0,0000,1378  ;3627           RC[0E]_0                        ;
U 1378, 0818,0038,7580,0800,0000,1379  ;3628           D_K[.20]                        ; GENERATE THE INCREMENT FOR THE
U 1379, 0D00,003C,0180,0800,0000,137A  ;3629           D_DAL.SC
U 137A, 0B00,003C,0180,0800,0000,137B  ;3630           D_D.SWAP                        ; EXPECTED DATA
U 137B, 0001,003C,0180,0A90,0000,137F  ;3631           R[2]_D                          ; SAVE
```

```
                                        ;3632
U 137F, 0818,0038,6580,0800,0000,1380   ;3633           D_K[.10]
U 1380, 0019,0014,0580,09E0,0000,1156   ;3634           RC[0C]_D+K[.1]                ; SET THE LOOP COUNT
U 1156, 0000,003D,0180,0800,0000,1189   ;3635   =0      ERLOOP
U 1157, 0F00,003C,0180,0800,0000,1381   ;3636   T15FL2: D_0
U 1381, 0000,003C,3580,3C00,0000,1382   ;3637           ID[VECTOR]_D                  ; INIT HTE VECTOR REGISTER
U 1382, 0800,003C,0180,0A18,0000,1383   ;3638           D_R[3]                        ; GET THE TEST PATTERN
U 1383, 0000,003C,3580,3C00,0000,1384   ;3639   SYNC24: ID[VECTOR]_D                  ; EXECUTE THE TEST
U 1384, 0810,0038,35F0,2D70,0000,1385   ;3640   SYNC25: Q_ID[VECTOR],D_RC[0E]         ; READ THE VECTOR REGISTER
U 1385, 001C,0034,01C0,0A08,0000,1386   ;3641           Q_Q.AND.R[1]                  ; MASK
U 1386, 001D,2000,0180,0800,0010,1387   ;3642           A[U_Q-D,CLK.UBCC              ; CHECK
U 1387, 0000,013C,0180,0800,0000,1158   ;3643           Z?
U 1158, 0001,203D,0180,09E8,0000,118C   ;3644   =0      ERROR2,RC[0D]_Q               ; VECTOR REGISTER FAILED
U 1159, 0800,003C,0180,0A18,0000,1388   ;3645           D_R[3]                        ; GENERATE THE NEXT INPUT PATTERN
U 1388, 0500,003C,0180,0800,0000,1389   ;3646           D_D.LEFT
U 1389, 0001,003C,0180,0A98,0000,138A   ;3647           R[3]_D                        ; SAVE
U 138A, 0810,0038,0180,0970,0010,138B   ;3648           D_RC[0E],CLK.UBCC             ; GENERATE THE EXPECTED VALUE
U 138B, 0000,013C,0180,0A28,0000,115A   ;3649           Z?,LAB_R[5]                   ; BRANCH IF ZERO
U 115A, 0000,003C,0180,0800,0000,138C   ;3650   =0      J/T9P1
U 115B, 0000,003C,0180,09F0,0000,138E   ;3651           RC[0E]_LA,J/T9P2
U 138C, 0000,003C,0180,0A10,0000,138D   ;3652   T9P1:   LAB_R[2]
U 138D, 001C,2014,0180,09F0,0000,138E   ;3653           RC[0E]_LA+D                   ; ...
U 138E, 0810,0038,0180,0960,0000,1391   ;3654   T9P2:   D_RC[0C]
U 1391, 0019,8000,0580,09E0,0010,1392   ;3655           RC[0C]_D-K[.1],CLK.UBCC,BYTE  ; CHECK THE LOOP COUNT
U 1392, 0000,013C,0180,0800,0000,115C   ;3656           Z?
U 115C, 0000,003C,0180,0800,0000,1157   ;3657   =0      J/T15FL2                      ; CONTINUE
U 115D, 0000,003C,0180,0800,0000,115E   ;3658           NOP
                                        ;3659
```

```
                                           ;3660   .PAGE   "TEST 160       SOFTWARE INTERRUPT REQUEST REGISTER"
                                           ;3661   ;*********************************************************************
                                           ;3662   ;++
                                           ;3663   ; TEST  160     SOFTWARE INTERRUPT REQUEST REGISTER
                                           ;3664   ;
                                           ;3665   ; TEST DESCRIPTION
                                           ;3666   ;       THIS TEST FLOATS A ZERO AND A ONE THRU THE LOWER 16 BITS OF THE
                                           ;3667   ;       SOFTWARE INTERRUPT REQUEST REGISTER.
                                           ;3668   ;
                                           ;3669   ;       SUBTST 1 - FLOAT A ZERO THRU THE REGISTER
                                           ;3670   ;       SUBTST 2 - FLOAT A ONE THRU THE REGISTER
                                           ;3671   ;
                                           ;3672   ; LOGIC DESCRIPTION
                                           ;3673   ;       THIS TEST CHECKS THE SOFTWARE INTERRUPT REQUEST REGISTER
                                           ;3674   ;       ON THE CEH AND ICL MODULE AND THE ID BUS INTERFACE TO THE REGISTER.
                                           ;3675   ;
                                           ;3676   ; ERROR DESCRIPTION
                                           ;3677   ;       DATA: EXPECTED SIR
                                           ;3678   ;             RECEIVED SIR
                                           ;3679   ;             LOOP COUNT -- DEFINES THE BIT CURRENTLY BEING TESTED.
                                           ;3680   ;               10= BIT 0, F= BIT 1, E= BIT 2, ETC.
                                           ;3681   ;
                                           ;3682   ; SYNC POINT DESCRIPTION
                                           ;3683   ;       SUBTST 1 - SYNC38--SIR IS LOADED WITH THE PATTERN
                                           ;3684   ;                  SYNC39--SIR IS READ OVER THE ID BUS
                                           ;3685   ;       SUBTST 2 - SYNC3A--SIR IS LOADED WITH THE PATTERN
                                           ;3686   ;                  SYNC3B--SIR IS READ OVER THE ID BUS
                                           ;3687   ;--
                                           ;3688   ;*********************************************************************
                                           ;3689   =0
U 115E, 0018,0039,0D80,09F8,0000,1175      ;3690   T160:   NEWTST[.3]
                                           ;3691
                                           ;3692   ;/////////////////////////////////////////////////////////////////////
                                           ;3693   ;+
                                           ;3694   ; FIRST FLOAT A ZERO THRU THE SIR REGISTER
                                           ;3695   ;-
                                           ;3696
U 115F, 0818,0038,F180,0800,0000,1393      ;3697   T160S1: D_K[.FFFC]                      ; GENERATE THE INITIAL TEST PATTERN
U 1393, 081A,4014,0980,0800,0000,1394      ;3698           D_D.SXT[WORD]+K[.2]             ; ...
U 1394, 0001,003C,0180,0A80,0000,1395      ;3699           R[0]_D
U 1395, 0001,003C,0180,0A88,0000,1160      ;3700           R[1]_D                          ; SAVE AS A MASK
U 1160, 0001,003D,0180,09F0,0000,11A3      ;3701   =0      SUBTEST,RC[0E]_D                ; SAVE AS EXPECTED DATA
U 1161, 0018,0038,6580,09E0,0000,1162      ;3702           RC[0C]_K[.10]                   ; SET THE LOOP COUNT
U 1162, 0000,003D,0180,0800,0000,1189      ;3703   =0      ERLOOP
U 1163, 0800,003C,0180,0A00,0000,1396      ;3704   T160L2: D_R[0]                          ; GET THE TEST PATTERN
U 1396, 0000,003C,3980,3C00,0000,1397      ;3705   SYNC38: ID[SIR]_D                       ; LOAD THE REGISTER
U 1397, 0810,0038,39F0,2D70,0000,1398      ;3706   SYNC39: Q_ID[SIR],D_RC[0E]              ; READ IT BACK
U 1398, 001D,6000,0180,0800,0010,1399      ;3707           A[U_Q-D,CLK.UBCC,WORD           ; CHECK
U 1399, 0000,013C,0180,0800,0000,1164      ;3708           BEN7Z
U 1164, 0001,603D,0180,09E8,0000,118C      ;3709   =0      ERROR2,RC[0D]_Q,WORD            ; BIT STUCK IN SIR
U 1165, 0000,003C,01C0,0A00,0000,139A      ;3710           Q_R[0]                          ; GET THE TEST PATTERN
U 139A, 0000,003C,03A8,0800,0000,139B      ;3711           Q_Q.LEFT,SI/MUL-                ; GENERATE NEXT PATTERN
U 139B, 0C01,203C,0180,0A80,0000,139C      ;3712           R[0]_Q,D_Q                      ; SAVE
U 139C, 081C,2034,0180,0A08,0000,139D      ;3713           D_D.AND.R[1]                    ; MASK
U 139D, 0001,003C,0180,09F0,0000,139E      ;3714           RC[0E]_D                        ; SET EXPECTED DATA
```

```
U 139E, 0810,0038,0180,0960,0000,139F   ;3715              D_RC[0C]
U 139F, 0019,8000,0580,09E0,0010,13A0   ;3716              RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
U 13A0, 0000,013C,0180,0800,0000,1166   ;3717              BEN/Z
U 1166, 0000,003C,0180,0800,0000,1163   ;3718     =0       J/T160L2                        ; CONTINUE
                                        ;3719
                                        ;3720     ;/////////////////////////////////////////////////////////////////////////
                                        ;3721     ;+
                                        ;3722     ; NOW FLOAT A ONE THRU THE REGISTER
                                        ;3723     ;-
                                        ;3724
U 1167, 0018,0038,0580,0A80,0000,1168   ;3725     T160S2: R[0]_K[.1]                       ; SET THE INITIAL TEST PATTERN
U 1168, 0003,003D,0180,09F0,0000,11A3   ;3726     =0       SUBTEST,RC[0E]_0                ; SET INITIAL EXPECTED DATA
U 1169, 0018,0038,6580,09E0,0000,116A   ;3727              RC[0C]_K[.10]                   ; SET THE LOOP COUNT
U 116A, 0000,003D,0180,0800,0000,1189   ;3728     =0       ERLOOP
U 116B, 0800,003C,0180,0A00,0000,13A1   ;3729     T160L1: D_R[0]                           ; GET TEST PATTERN
U 13A1, 0000,003C,3980,3C00,0000,13A2   ;3730     SYNC3A: ID[SIR]_D                        ; LOAD THE PATTERN
U 13A2, 0810,0038,39F0,2D70,0000,13A3   ;3731     SYNC3B: Q_ID[SIR],D_RC[0E]               ; READ IT BACK
U 13A3, 0019,2034,C1C0,0800,0000,13A4   ;3732              Q_Q.AND.K[.FFFF]                ; MASK
U 13A4, 001D,2000,0180,0800,0010,13A5   ;3733              ALU_Q-D,CLK.UBCC                ; CHECK
U 13A5, 0000,013C,0180,0800,0000,116C   ;3734              BEN/Z
U 116C, 0001,203D,0180,09E8,0000,118C   ;3735     =0       ERROR2,RC[0D]_Q                 ; BIT STUCK IN SIR REG
U 116D, 0800,003C,0180,0A00,0000,13A6   ;3736              D_R[0]                          ; GET CURRENT PATTERN
U 13A6, 0500,003C,0180,0800,0000,13A7   ;3737              D_D.LEFT                        ; GENERATE NEXT PATTERN
U 13A7, 0001,003C,0180,0A80,0000,13A8   ;3738              R[0]_D                          ; SAVE
U 13A8, 0001,003C,0180,09F0,0000,13A9   ;3739              RC[0E]_D                        ; ...
U 13A9, 0810,0038,0180,0960,0000,13AA   ;3740              D_RC[0C]
U 13AA, 0019,8000,0580,09E0,0010,13AB   ;3741              RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP
U 13AB, 0000,013C,0180,0800,0000,116E   ;3742              BEN/Z
U 116E, 0000,003C,0180,0800,0000,116B   ;3743     =0       J/T160L1                        ; CONTINUE
U 116F, 0000,003C,0180,0800,0000,13AC   ;3744              NOP
                                        ;3745
                                        ;3746
U 13AC, 0000,003D,0180,0800,0000,1175   ;3747     ENDTST: NEWTST
                                        ;3748
```

```
                                                                         G 10
ZZ-ESKAH-V132  Line Number Index                                                                                                    SEQ 1149
ESKAH3A.MCR                      MICRO2  1M(01)    16-DEC-82  12:35:45                                                              Page   9
;                               Location / Line Number Index

;Location         0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 0000 - 0FFF Unused
U 1000            1876:   1845    1847=   1866=   1867=   1868=   1884=   1885=
U 1008            2032=   2033=   2034=   2035=   2036=   2037=   2038=   2039=
U 1010            2069=   2071=   2074=   2076=   2079=   2081=   2114=   2115=
U 1018            2127=   2128=   2129=   2130=   2132=   2133=   2135=   2141=
U 1020            2148=   2149=   2181=   2182=   2191=   2192=   2194=   2195=
U 1028            2198=   2199=   2249=   2250=   2258=   2259=   2260=   2261=
U 1030            2270=   2271=   2273=   2274=   2283=   2284=   2295=   2296=
U 1038            2297=   2298=   2299=   2300=   2302=   2303=   2312=   2313=
U 1040            2318=   2319=   2320=   2321=   2322=   2323=   2325=   2326=
U 1048            2335=   2336=   2345=   2346=   2347=   2348=   1920:   1846
U 1050            2349=   2350=   2352=   2353=   2366=   2367=   2373=   2374=
U 1058            2398=   2399=   1924:   1869    2427=   2428=   1928:   1870
U 1060            2432=   2433=   2437=   2438=   2508=   2509=   2510=   2511=
U 1068            2521=   2522=   2527=   2528=   2534=   2535=   2536=   2537=
U 1070            2544=   2550=   2556=   2565=   2566=   2567=   2568=   2569=
U 1078            2571=   2572=   2578=   2587=   2588=   2589=   2590=   2591=
U 1080            2593=   2594=   2602=   2611=   2613=   2614=   2615=   2616=
U 1088            2624=   2633=   2634=   2635=   2637=   2638=   2640=   2641=
U 1090            2646=   2655=   2656=   2657=   2659=   2660=   2668=   2676=
U 1098            2677=   2678=   2679=   2680=   2683=   2684=   2692=   2700=
U 10A0            2701=   2702=   2705=   2706=   2707=   2708=   2717=   2726=
U 10A8            2727=   2728=   2729=   2730=   2732=   2733=   2734=   2735=
U 10B0            2737=   2738=   2745=   2754=   2755=   2756=   2758=   2759=
U 10B8            2768=   2777=   2778=   2779=   2781=   2782=   2790=   2798=
U 10C0            2799=   2800=   2801=   2802=   2811=   2820=   2821=   2822=
U 10C8            2824=   2825=   2833=   2834=   2874=   2875=   2876=   2877=
U 10D0            2888=   2889=   2890=   2891=   2897=   2905=   2906=   2907=
U 10D8            2912=   2913=   2919=   2920=   2949=   2950=   2951=   2952=
U 10E0            2953=   2954=   2972=   2973=   2981=   2987=   2998=   2999=
U 10E8            3049=   3050=   3071=   3072=   3080=   3086=   3094=   3095=
U 10F0            3101=   3102=   3150=   3151=   3152=   3153=   3169=   3170=
U 10F8            3177=   3178=   3203=   3204=   3217=   3218=   3226=   3227=
U 1100            1831:   1832:   1833:   1834:   1835:   1836:   1837:   1838:
U 1108            1839:   1871    3233=   3234=   1840:   1841:   1842:   1843:
U 1110            3272=   3273=   3287=   3288=   3289=   3290=   3298=   3299=
U 1118            3306=   3315=   3317=   3318=   3320=   3321=   3322=   3323=
U 1120            3331=   3332=   3339=   3348=   3350=   3351=   3355=   3356=
U 1128            3364=   3365=   3372=   3380=   3382=   3383=   3387=   3388=
U 1130            3396=   3397=   3404=   3405=   3441=   3442=   3459=   3460=
U 1138            3461=   3462=   3470=   3478=   3480=   3481=   3486=   3487=
U 1140            3495=   3503=   3505=   3506=   3508=   3509=   3517=   3518=
U 1148            3563=   3564=   3580=   3581=   3583=   3584=   3592=   3598=
U 1150            3610=   3619=   3621=   3622=   1872    2435:   3635=   3636=
U 1158            3644=   3645=   3650=   3651=   3657=   3658=   3690=   3697=
U 1160            3701=   3702=   3703=   3704=   3709=   3710=   3718=   3725=
U 1168            3726=   3727=   3728=   3729=   3735=   3736=   3743=   3744=
U 1170            1873    1874    1875    1882    1883    1897    1898    1899
U 1178            1900    1901    1902    1903    1904    1905    1906    1907
U 1180            1908    1909    1910    1911    1912    1913    1914    1915
U 1188            1916    1917    1918    1919    1922    1923    1966    1967
U 1190            1968    1969    1970    1971    1972    1973    1974    1975
U 1198            1976    1977    1978    1979    1980    1981    1983    1984
```

```
;Location           0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 11A0              1985     1986     1988     1998     1999     2007     2008     2009
U 11A8              2013     2014     2040     2050     2051     2052     2053     2054
U 11B0              2055     2056     2064     2065     2066     2067     2068     2072
U 11B8              2073     2077     2078     2082     2083     2116     2117     2124
U 11C0              2125     2126     2134     2142     2143     2144     2145     2146
U 11C8              2147     2183     2196     2197     2262     2263     2264     2265
U 11D0              2266     2267     2268     2269     2272     2285     2286     2287
U 11D8              2288     2289     2290     2291     2292     2293     2294     2301
U 11E0              2314     2315     2316     2317     2324     2337     2338     2339
U 11E8              2340     2341     2342     2343     2344     2351     2354     2355
U 11F0              2356     2368     2369     2370     2371     2372     2376     2377
U 11F8              2378     2379     2380     2381     2382     2383     2384     2385
U 1200              2386     2387     2388     2389     2390     2391     2392     2393
U 1208              2394     2395     2396     2397     2429     2430     2431     2436
U 1210              2523     2524     2525     2529     2530     2531     2532     2533
U 1218              2538     2539     2540     2541     2542     2543     2551     2552
U 1220              2553     2554     2555     2570     2573     2574     2575     2576
U 1228              2577     2592     2595     2596     2597     2598     2599     2600
U 1230              2601     2612     2617     2618     2619     2620     2621     2622
U 1238              2623     2636     2639     2642     2643     2644     2645     2658
U 1240              2661     2662     2663     2664     2665     2666     2667     2681
U 1248              2682     2685     2686     2687     2688     2689     2690     2691
U 1250              2703     2704     2709     2710     2711     2712     2713     2714
U 1258              2715     2716     2731     2736     2739     2740     2741     2742
U 1260              2743     2744     2757     2760     2761     2762     2763     2764
U 1268              2765     2766     2767     2780     2783     2784     2785     2786
U 1270              2787     2788     2789     2803     2804     2805     2806     2807
U 1278              2808     2809     2810     2823     2826     2827     2828     2829
U 1280              2830     2831     2832     2878     2879     2892     2893     2894
U 1288              2895     2896     2908     2909     2910     2911     2914     2915
U 1290              2916     2917     2918     2955     2956     2957     2958     2959
U 1298              2960     2961     2962     2963     2971     2974     2975     2976
U 12A0              2977     2978     2979     2980     2988     2989     2990     2991
U 12A8              2992     2993     2434:    2994     2995     2996     2997     3051
U 12B0              3052     3053     3054     3055     3056     3057     3065     3066
U 12B8              3067     3068     3069     3070     3073     3074     3075     3076
U 12C0              3077     3078     3079     3087     2025:    3088     3089     3090
U 12C8              3091     3092     3093     3096     3097     3098     3099     3100
U 12D0              3154     3155     3156     3157     3158     3159     3160     3161
U 12D8              3171     3172     3173     3174     3175     3176     3205     3206
U 12E0              3207     3208     3216     3219     3220     3221     3222     3223
U 12E8              3224     3225     3228     3229     3230     3231     3232     3274
U 12F0              3275     3276     3277     3278     3291     3292     3293     3294
U 12F8              3295     3296     3297     3300     3301     3302     3303     3304
U 1300              3305     3316     3319     3324     3325     3326     3327     3328
U 1308              2016:    3329     3330     3333     3334     3335     3336     3337
U 1310              3338     3349     3352     3354     3357     3358     3359     3360
U 1318              3361     3362     3363     3366     3367     3368     3369     3370
U 1320              3371     3381     3384     3386     3389     3390     3391     3392
U 1328              3393     3394     3395     3398     3399     3400     3401     3402
U 1330              3403     3443     3444     3445     3446     3447     3448     3449
U 1338              3450     3463     3464     3465     2017:    3466     3467     3468
U 1340              3469     3479     3482     3483     3484     3485     3488     3489
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348           3490    3491    3492    3493    3494    3504    3507    2018:
U 1350           3510    3511    3512    2019:   3513    3514    3515    3516
U 1358           3565    3566    3567    3568    3569    3570    3571    3582
U 1360           3585    3586    3587    3588    3589    3590    3591    3599
U 1368           3600    3601    3602    3603    3604    3605    3606    3607
U 1370           3608    3609    3620    3623    3624    3625    3626    3627
U 1378           3628    3629    3630    3631    2020:   2021:   2022:   3633
U 1380           3634    3637    3638    3639    3640    3641    3642    3643
U 1388           3646    3647    3648    3649    3652    3653    3654    2023:
U 1390           2024:   3655    3656    3698    3699    3700    3705    3706
U 1398           3707    3708    3711    3712    3713    3714    3715    3716
U 13A0           3717    3730    3731    3732    3733    3734    3737    3738
U 13A8           3739    3740    3741    3742    3747
U 13B0 - 13EF Unused
U 13F0           1934:   1935:   1936:   1937:   1938:   1939:   1940:   1941:
U 13F8           1942:   1943:   1944:   1945:   1946:   1947:   1948:   1949:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH3A        957

Used             957
Remaining

Total microwords used in memory U: 957
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESKOODEF.MIC
ESKOOMAC.MIC
ESKAHMAC.MIC
ESKAH3A.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3      Control ROM Field Definitions
; 548    Register Transfer Macro Definitions
; 1413   Non-transfer Functions
; 1485   Branch Enable Macro Definitions
; 1564   MICRO DIAGNOSTIC DEFINED MACROS
; 2353   TEST 161         INTERVAL COUNTER
; 2689   TEST 162         IPL ACTIVE BITS IN THE SIR REGISTER & IPL_IPL ACTIVE IN PSL
; 2882   TEST 163         BRANCH ENABLE E -- INTERRUPT
; 2965   TEST 164         INTERRUPT REQUEST COMPARATOR
; 3171   TEST 165         INSTRUCTION BUFFER SERVICE BIT GENERATION
; 3293   TEST 166         HALT PENDING BIT
; 3493   TEST 167         PC REGISTER INCREMENT BY 'N' WITH 'SAVE' ACTIVE
```

```
;1      .NOLIST
;1804   .LIST
;1805
```

```
                                        .REGION/1000,13FF

                                        ;+
                                        ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                        ; WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
                                        ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                        ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                        ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                        ;
                                        ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                        ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                        ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                        ;       R[OF] AND DO A RETURNO.
                                        ;
                                        ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                        ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                        ; TO THE CONSOLE.
                                        ;
                                        ; THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
                                        ; ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURNO IF THE TRAP WAS
                                        ; EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
                                        ; RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
                                        ; STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.
                                        ;-

U 1100, 0000,003C,19C0,0A78,0084,7001   1100:   SC_K[ZERO],Q_R[OF],J/TRPHO      ; SYSTEM INIT
U 1101, 0000,003C,05C0,0A78,0084,7001   1101:   SC_K[.1],Q_R[OF],J/TRPHO        ; DATA UNALIGNED
U 1102, 0000,003C,09C0,0A78,0084,7001   1102:   SC_K[.2],Q_R[OF],J/TRPHO        ; X PAGE ERROR
U 1103, 0000,003C,0DC0,0A78,0084,7001   1103:   SC_K[.3],Q_R[OF],J/TRPHO        ; TB MODIFY
U 1104, 0000,003C,11C0,0A78,0084,7001   1104:   SC_K[.4],Q_R[OF],J/TRPHO        ; TB PROT ERROR
U 1105, 0000,003C,D5C0,0A78,0084,7001   1105:   SC_K[.6],Q_R[OF],J/TRPHO        ; TB MISS
U 1106, 0000,003C,D9C0,0A78,0084,7001   1106:   SC_K[.9],Q_R[OF],J/TRPHO        ; RES FLOAT OPER
U 1107, 0000,003C,5DC0,0A78,0084,7001   1107:   SC_K[.7],Q_R[OF],J/TRPHO        ; TB PARITY
U 1108, 0000,003C,01C0,0A78,0084,7001   1108:   SC_K[.8],Q_R[OF],J/TRPHO        ; CACHE PARITY
U 110C, 0000,003C,85C0,0A78,0084,7001   110C:   SC_K[.C],Q_R[OF],J/TRPHO        ; RDS
U 110D, 0000,003C,89C0,0A78,0084,7001   110D:   SC_K[.D],Q_R[OF],J/TRPHO        ; TIME OUT
U 110E, 0000,003C,65C0,0A78,0084,7001   110E:   SC_K[.10],Q_R[OF],J/TRPHO       ; ODD ADDRESS
U 110F, 0000,003C,61C0,0A78,0084,716B   110F:   SC_K[.F],Q_R[OF],J/TRPH2        ; CS PARITY

U 1001, 0001,2024,0180,0800,0010,1006   TRPHO:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 1006, 0000,013C,0180,0800,0000,1002           Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000   =0      ALU_Q[AND]MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN


                                        ;+
                                        ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                        ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                        ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                        ;
                                        ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                        ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                        ;             FAULT STATUS REGISTER
                                        ;             SBI ERROR REGISTER
                                        ;             TIMEOUT ADDRESS REGISTER
                                        ;             MAINTENANCE REGISTER
                                        ;1861   ;               CACHE PARITY REGISTER
                                        ;1862   ;               TB ERROR REGISTER 1
                                        ;1863   ;               TB ERROR REGISTER 0
                                        ;1864   ;-
                                        ;1865
U 1003, 0018,0038,1D80,09E8,0000,1004   ;1866   TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,718B   ;1867   =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,100E   ;1868           Q_ID[TBER0]
U 100E, 0001,203C,4DF0,2DB0,0000,104F   ;1869           RC[6]_Q,Q_ID[TBER1]
U 104F, 0001,203C,65F0,2DB8,0000,105B   ;1870           RC[7]_Q,Q_ID[SBI.ERR]
U 105B, 0001,203C,6DF0,2DD8,0000,105F   ;1871           RC[0B]_Q,Q_ID[FAULT]
U 105F, 0001,203C,75F0,2DE0,0000,1109   ;1872           RC[0C]_Q,Q_ID[MAINT]
U 1109, 0001,203C,79F0,2DC8,0000,1154   ;1873           RC[9]_Q,Q_ID[PARITY]
U 1154, 0001,203C,69F0,2DC0,0000,116A   ;1874           RC[8]_Q,Q_ID[TIME.ADDR]
U 116A, 0001,203C,81F0,2DD0,0000,1000   ;1875           RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,1182   ;1876   1000:   RC[0E]_Q,ERROR1
                                        ;1877
                                        ;1878   ;+
                                        ;1879   ; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
                                        ;1880   ;-
                                        ;1881
U 116B, 0001,2024,0180,0800,0010,116C   ;1882   TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS THE TRAP EXPECTED?
U 116C, 0000,013C,0180,0800,0000,1008   ;1883           Z?                              ; BRANCH IF NO
U 1008, 0001,2036,0180,0AF8,0000,0001   ;1884   =0      ALU_Q[AND]MASK,R[0F]_ALU,RETURN1 ; RETURN
U 1009, 0000,003C,0180,0800,0000,1003   ;1885           J/TRPH1                         ; REPORT UNEXPECTED TRAP
                                        ;1886
                                        ;1887
                                        ;1888   ;+
                                        ;1889   ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                        ;1890   ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                        ;1891   ;                NEWTST
                                        ;1892   ;                ERLOOP
                                        ;1893   ;                ERROR1
                                        ;1894   ;                ERROR2
                                        ;1895   ;
                                        ;1896
U 116D, 0000,003C,65F8,0800,0084,716E   ;1897   SCOPE:  SC_K[.10],Q_0                   ; SETUP TO WRITE IPL OF 1F
U 116E, 0818,0038,8D80,0800,0000,116F   ;1898           D_K[.1F]                        ; ...
U 116F, 0D00,003C,0180,0800,0000,1170   ;1899           D_DAL.SC
U 1170, 0000,003C,3D80,3C00,0000,1171   ;1900           ID[PSL]_D                       ; WRITE THE PSL
U 1171, 0818,0038,0580,0800,0000,1172   ;1901           D_K[.1]                         ; SETUP TO CLEAR THE CES REGISTER
U 1172, 0D00,003C,0180,0800,0000,1173   ;1902           D_DAL.SC
U 1173, 0F00,003C,3180,3C00,0000,1174   ;1903           ID[CES]_D,D_0                   ; CLEAR THE CES REGISTER
U 1174, 0000,003C,5D80,3C00,0000,1175   ;1904           ID[ACC.CS]_D                    ; SHUT OFF THE FLOATING POINT
U 1175, 0000,003C,3980,3C00,0000,1176   ;1905           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 1176, 0000,003C,2980,3C00,0000,1177   ;1906           ID[CLK.CS]_D                    ; STOP INTERVAL TIMER
U 1177, 0000,003C,4980,3C00,0000,1178   ;1907           ID[TBER0]_D                     ; SHUT OFF THE TB
U 1178, 0000,003C,7180,3C00,0000,1179   ;1908           ID[COMP]_D                      ; CLEAR SILO COMPARATOR
U 1179, 0818,0038,C180,0800,0000,117A   ;1909           D_K[.FFFF]
U 117A, 0000,003C,6580,3C00,0000,117B   ;1910           ID[SBI.ERR]_D
U 117B, 0F00,003C,6D80,3C00,0000,117C   ;1911           ID[FAULT]_D,D_0
U 117C, 0000,003C,6D80,3C00,0000,117D   ;1912           ID[FAULT]_D
U 117D, 0000,003C,6580,3C00,0000,117E   ;1913           ID[SBI.ERR]_D
U 117E, 0003,003C,0180,09F0,0000,117F   ;1914           RC[0E]_0
U 117F, 0003,003C,0180,0AF8,0000,1180   ;1915           R[0F]_0
```

```
U 1180, 0003,003C,0180,09E8,0000,105E    ;1916            RC[OD]_0,J/CALLCON                ; CALL THE CONSOLE
U 1181, 0818,0038,0980,0800,0000,105E    ;1917   ERLOOP: D_K[.2],J/CALLCON                  ; ERRLOOP CALL
U 1182, 0810,0038,0180,0978,0000,1183    ;1918   ERROR1: D_RC[0F]
U 1183, 0819,0034,4D80,0800,0000,104E    ;1919           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E    ;1920   104E:   D_D.OR.K[.4],J/CALLCON
                                         ;1921
U 1184, 0810,0038,0180,0978,0000,1185    ;1922   ERROR2: D_RC[0F]
U 1185, 0819,0034,4D80,0800,0000,105A    ;1923           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E    ;1924   105A:   D_D.OR.K[.6],J/CALLCON
                                         ;1925
                                         ;1926   105E:
                                         ;1927   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E    ;1928           ID[TXDB]_D,J/CALLCON               ; CALL THE CONSOLE
                                         ;1929
                                         ;1930   ;+
                                         ;1931   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                         ;1932   ;-
                                         ;1933
U 13F0, 0000,003C,0180,0800,0000,13F1    ;1934   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2    ;1935   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3    ;1936   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4    ;1937   13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5    ;1938   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6    ;1939   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7    ;1940   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8    ;1941   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9    ;1942   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA    ;1943   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB    ;1944   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC    ;1945   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD    ;1946   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE    ;1947   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF    ;1948   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1186    ;1949   13FF:   NOP
                                         ;1950
                                         ;1951
                                         ;1952   ;+
                                         ;1953   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
                                         ;1954   ; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
                                         ;1955   ; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
                                         ;1956   ; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
                                         ;1957   ;
                                         ;1958   ; FOR EXAMPLE: IF A HEX "CC" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
                                         ;1959   ;       THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
                                         ;1960   ;
                                         ;1961   ;               =0      D_0,CALL,J/DCC
                                         ;1962   ;                       NOP
                                         ;1963   ;               =0      CALL,J/DCC
                                         ;1964   ;-
                                         ;1965
U 1186, 0018,0038,C180,0800,0000,1187    ;1966   DCC:    ALU_K[.FFFF],J/S00
U 1187, 0118,0038,1B80,0800,0000,1188    ;1967   S00:    ALU_0(K),D_D.LEFT2,SI/7,J/SX
U 1188, 0100,003E,0380,0800,0000,0001    ;1968   SX:     D_D.LEFT2,SI/7,RETURN1             ; EXIT
                                         ;1969
                                         ;1970
```

```
                                                ;1971   ;+
                                                ;1972   ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                                ;1973   ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                                ;1974   ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                                ;1975   ; TYPING IT.
                                                ;1976   ;-
                                                ;1977
U 1189, 0810,0038,4D80,0978,0000,118A           ;1978   SUBTST: D_RC[OF],KMX/.FF00
U 118A, 0019,4016,4D80,09F8,0000,0001           ;1979           RC[OF]_D+K[.FF00],WORD,RETURN1
                                                ;1980
                                                ;1981   ;+
                                                ;1982   ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                                ;1983   ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                                ;1984   ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                                ;1985   ;-
                                                ;1986
U 118B, 0010,0038,01C0,0978,0000,118C           ;1987   SETRCF: Q_RC[OF]
U 118C, 0019,2034,4DC0,0800,0000,118D           ;1988           Q_Q.AND.K[.FF00]
U 118D, 0019,2032,1D80,09F8,0000,0001           ;1989           RC[OF]_Q.OR.SC,RETURN1
                                                ;1990
```

```
                                              ;1991
U 1155, 0019,2000,05C0,0800,0000,12AB         ;1992    1155:   Q_Q-K[.1],J/12AB
                                              ;1993    ;+
                                              ;1994    ; THE FOLLOWING ROUTINES ARE USES TO SET OR CLEAR BITS IN THE CONSOLE
                                              ;1995    ; REGISTERS. BYTE 0 OF THE D REGISTER MUST CONTAIN "C", BYTE ONE OF THE
                                              ;1996    ; D REGISTER MUST CONTAIN THE CONSOLE REGISTER ID, I.E. 0=TXCS, 2=RXCS,
                                              ;1997    ; AND 4=MCR, AND THE UPPER WORD OF THE D REGISTER MUST CONTAIN THE DATA
                                              ;1998    ; TO SET IN THE REGISTER.
                                              ;1999    ;
                                              ;2000    ; THE SUBROUTINES MUST BE CALLED WITH THE DATA TO LOAD INTO THE REGISTER
                                              ;2001    ; IN SCRATCH PAD R[OA].
                                              ;2002    ;
                                              ;2003    ; NOTE: ONLY BIT 15, 9 AND 8 OF THE MCR REGISTER CAN BE SET OR CLEARED.
                                              ;2004    ;       ONLY BIT 7 OF THE RXCS REGISTER CAN BE SET OR CLEARED.
                                              ;2005    ;       BIT 7 OF THE TXCS REGISTER IS ALWAYS SET WHILE THE MICRO CODE IS RUNNING.
                                              ;2006    ;-
                                              ;2007
U 118E, 0800,003C,D980,0A50,0084,718F         ;2008    SETMCR: D_R[OA],SC_K[.9]                ; INSERT BIT 9 INTO DATA
U 118F, 0001,001C,0180,0AD0,0000,1190         ;2009            R[OA]_D.ORNOT.MASK              ; ...
U 1190, 0818,0038,1180,0800,0000,1191         ;2010            D_K[.4]                         ; GET REGISTER ID
U 1191, 0000,003C,01F8,0800,0084,7192         ;2011            SC_K[.8],Q_0                    ; SETUP FOR SHIFT
U 1192, 0D00,003C,0180,0800,0000,1197         ;2012            D_DAL.SC,J/COMCON               ; SHIFT TO BYTE 1
                                              ;2013
U 1193, 0F00,003C,01F8,0800,0000,1197         ;2014    SETTXCS:D_0,J/COMCON,Q_0                ; SET REGISTER ID
U 1194, 0818,0038,0980,0800,0000,1195         ;2015    SETRXCS:D_K[.2]                         ; GET REGISTER ID
U 1195, 0000,003C,01F8,0800,0084,7196         ;2016            SC_K[.8],Q_0                    ; SETUP FOR SHIFT
U 1196, 0D00,003C,0180,0800,0000,1197         ;2017            D_DAL.SC,J/COMCON               ; PUT IN BYTE 1
                                              ;2018
U 1197, 0019,0030,8580,0AD8,0000,1198         ;2019    COMCON: R[OB]_D.OR.K[.C]                ; INSERT BYTE 0 AND SAVE
U 1198, 0800,003C,0180,0A50,0000,1199         ;2020            D_R[OA]                         ; GET DATA TO PUT IN CONSOLE REG
U 1199, 0000,003C,6580,0800,0084,719A         ;2021            SC_K[.10]                       ; SETUP FOR SHIFT
U 119A, 0D00,003C,0180,0A58,0000,119B         ;2022            D_DAL.SC,LAB_R[OB]              ; PUT IN UPPER WORD
U 119B, 081C,2030,0180,0800,0000,105E         ;2023            D_LA.OR.D,J/CALLCON             ; INSERT LOWER WORD AND CALL CONSOLE
                                              ;2024
                                              ;2025    ;+
                                              ;2026    ; THIS SUBROUTINE SETS THE HALT PENDING BIT BY SETTING THE HALT REQUEST
                                              ;2027    ; BIT IN THE CONSOLE, EXECUTING AN INTERRUPT ACK, AND THEN CLEARS THE
                                              ;2028    ; HALT REQUEST BIT IN THE CONSOLE.
                                              ;2029    ;-
                                              ;2030
                                              ;2031    =0
U 100A, 0018,0039,4580,0AD0,0000,118E         ;2032    SETHP:  SETMCR[.8000]                   ; SET THE HALT REQUEST BIT
U 100B, 0000,003C,0180,0800,8000,100C         ;2033            INTRPT.ACK                      ; SET THE HP BIT
U 100C, 0018,0039,1980,0AD0,0000,118E         ;2034    =0      SETMCR[ZERO]                    ; CLEAR THE HALT REQUEST BIT
U 100D, 0000,003E,0180,0800,0000,0001         ;2035            RETURN1
                                              ;2036
                                              ;2037    ;+
                                              ;2038    ; THE FOLLOWING 256 LOCATIONS ARE THE DISPATCH TABLE FOR THE CALL 3'S.
                                              ;2039    ; THE INSTRUCTION AT LOCATION "DISPAT" LOADS THE Q REGISTER WITH HEX 100
                                              ;2040    ; AND THEN EXECUTES THE CALL 3. THIS TABLE THEN DECREMENTS THE Q REGISTER.
                                              ;2041    ; THE LAST INSTRUCTION IN THE TABLE DOES A RETURN1, WHICH RETURNS TO
                                              ;2042    ; THE TEST THAT MADE THE CALL. THE Q REGISTER HAS THE 8 BIT ADDRESS THAT
                                              ;2043    ; THE INSTRUCTION BUFFER FORCED WHEN THE RETURN IS MADE.
                                              ;2044    ;-
                                              ;2045
```

```
                                          ;2046    SYNC00:
U 119C, 0038,003B,41C0,0800,1000,1200     ;2047    CALL3:  Q_ALU.LEFT,ALU_K[.80],SI/ZERO,SUB/SPEC,MSC/IRD,J/DISPATTBL
                                          ;2048
                                          ;2049
                                          ;2050    1200:
                                          ;2051    DISPATTBL:
U 1200, 0019,2000,05C0,0800,0000,1201     ;2052    1200:    Q_Q-K[.1]
U 1201, 0019,2000,05C0,0800,0000,1202     ;2053    1201:    Q_Q-K[.1]
U 1202, 0019,2000,05C0,0800,0000,1203     ;2054    1202:    Q_Q-K[.1]
U 1203, 0019,2000,05C0,0800,0000,1204     ;2055    1203:    Q_Q-K[.1]
U 1204, 0019,2000,05C0,0800,0000,1205     ;2056    1204:    Q_Q-K[.1]
U 1205, 0019,2000,05C0,0800,0000,1206     ;2057    1205:    Q_Q-K[.1]
U 1206, 0019,2000,05C0,0800,0000,1207     ;2058    1206:    Q_Q-K[.1]
U 1207, 0019,2000,05C0,0800,0000,1208     ;2059    1207:    Q_Q-K[.1]
U 1208, 0019,2000,05C0,0800,0000,1209     ;2060    1208:    Q_Q-K[.1]
U 1209, 0019,2000,05C0,0800,0000,120A     ;2061    1209:    Q_Q-K[.1]
U 120A, 0019,2000,05C0,0800,0000,120B     ;2062    120A:    Q_Q-K[.1]
U 120B, 0019,2000,05C0,0800,0000,120C     ;2063    120B:    Q_Q-K[.1]
U 120C, 0019,2000,05C0,0800,0000,120D     ;2064    120C:    Q_Q-K[.1]
U 120D, 0019,2000,05C0,0800,0000,120E     ;2065    120D:    Q_Q-K[.1]
U 120E, 0019,2000,05C0,0800,0000,120F     ;2066    120E:    Q_Q-K[.1]
U 120F, 0019,2000,05C0,0800,0000,1210     ;2067    120F:    Q_Q-K[.1]
U 1210, 0019,2000,05C0,0800,0000,1211     ;2068    1210:    Q_Q-K[.1]
U 1211, 0019,2000,05C0,0800,0000,1212     ;2069    1211:    Q_Q-K[.1]
U 1212, 0019,2000,05C0,0800,0000,1213     ;2070    1212:    Q_Q-K[.1]
U 1213, 0019,2000,05C0,0800,0000,1214     ;2071    1213:    Q_Q-K[.1]
U 1214, 0019,2000,05C0,0800,0000,1215     ;2072    1214:    Q_Q-K[.1]
U 1215, 0019,2000,05C0,0800,0000,1216     ;2073    1215:    Q_Q-K[.1]
U 1216, 0019,2000,05C0,0800,0000,1217     ;2074    1216:    Q_Q-K[.1]
U 1217, 0019,2000,05C0,0800,0000,1218     ;2075    1217:    Q_Q-K[.1]
U 1218, 0019,2000,05C0,0800,0000,1219     ;2076    1218:    Q_Q-K[.1]
U 1219, 0019,2000,05C0,0800,0000,121A     ;2077    1219:    Q_Q-K[.1]
U 121A, 0019,2000,05C0,0800,0000,121B     ;2078    121A:    Q_Q-K[.1]
U 121B, 0019,2000,05C0,0800,0000,121C     ;2079    121B:    Q_Q-K[.1]
U 121C, 0019,2000,05C0,0800,0000,121D     ;2080    121C:    Q_Q-K[.1]
U 121D, 0019,2000,05C0,0800,0000,121E     ;2081    121D:    Q_Q-K[.1]
U 121E, 0019,2000,05C0,0800,0000,121F     ;2082    121E:    Q_Q-K[.1]
U 121F, 0019,2000,05C0,0800,0000,1220     ;2083    121F:    Q_Q-K[.1]
U 1220, 0019,2000,05C0,0800,0000,1221     ;2084    1220:    Q_Q-K[.1]
U 1221, 0019,2000,05C0,0800,0000,1222     ;2085    1221:    Q_Q-K[.1]
U 1222, 0019,2000,C5C0,0800,0000,1223     ;2086    1222:    Q_Q-K[.1]
U 1223, 0019,2000,05C0,0800,0000,1224     ;2087    1223:    Q_Q-K[.1]
U 1224, 0019,2000,05C0,0800,0000,1225     ;2088    1224:    Q_Q-K[.1]
U 1225, 0019,2000,05C0,0800,0000,1226     ;2089    1225:    Q_Q-K[.1]
U 1226, 0019,2000,05C0,0800,0000,1227     ;2090    1226:    Q_Q-K[.1]
U 1227, 0019,2000,05C0,0800,0000,1228     ;2091    1227:    Q_Q-K[.1]
U 1228, 0019,2000,05C0,0800,0000,1229     ;2092    1228:    Q_Q-K[.1]
U 1229, 0019,2000,05C0,0800,0000,122A     ;2093    1229:    Q_Q-K[.1]
U 122A, 0019,2000,05C0,0800,0000,122B     ;2094    122A:    Q_Q-K[.1]
U 122B, 0019,2000,05C0,0800,0000,122C     ;2095    122B:    Q_Q-K[.1]
U 122C, 0019,2000,05C0,0800,0000,122D     ;2096    122C:    Q_Q-K[.1]
U 122D, 0019,2000,05C0,0800,0000,122E     ;2097    122D:    Q_Q-K[.1]
U 122E, 0019,2000,05C0,0800,0000,122F     ;2098    122E:    Q_Q-K[.1]
U 122F, 0019,2000,05C0,0800,0000,1230     ;2099    122F:    Q_Q-K[.1]
U 1230, 0019,2000,05C0,0800,0000,1231     ;2100    1230:    Q_Q-K[.1]
```

```
U 1231, 0019,2000,05C0,0800,0000,1232   ;2101    1231:    Q_Q-K[.1]
U 1232, 0019,2000,05C0,0800,0000,1233   ;2102    1232:    Q_Q-K[.1]
U 1233, 0019,2000,05C0,0800,0000,1234   ;2103    1233:    Q_Q-K[.1]
U 1234, 0019,2000,05C0,0800,0000,1235   ;2104    1234:    Q_Q-K[.1]
U 1235, 0019,2000,05C0,0800,0000,1236   ;2105    1235:    Q_Q-K[.1]
U 1236, 0019,2000,05C0,0800,0000,1237   ;2106    1236:    Q_Q-K[.1]
U 1237, 0019,2000,05C0,0800,0000,1238   ;2107    1237:    Q_Q-K[.1]
U 1238, 0019,2000,05C0,0800,0000,1239   ;2108    1238:    Q_Q-K[.1]
U 1239, 0019,2000,05C0,0800,0000,123A   ;2109    1239:    Q_Q-K[.1]
U 123A, 0019,2000,05C0,0800,0000,123B   ;2110    123A:    Q_Q-K[.1]
U 123B, 0019,2000,05C0,0800,0000,123C   ;2111    123B:    Q_Q-K[.1]
U 123C, 0019,2000,05C0,0800,0000,123D   ;2112    123C:    Q_Q-K[.1]
U 123D, 0019,2000,05C0,0800,0000,123E   ;2113    123D:    Q_Q-K[.1]
U 123E, 0019,2000,05C0,0800,0000,123F   ;2114    123E:    Q_Q-K[.1]
U 123F, 0019,2000,05C0,0800,0000,1240   ;2115    123F:    Q_Q-K[.1]
U 1240, 0019,2000,05C0,0800,0000,1241   ;2116    1240:    Q_Q-K[.1]
U 1241, 0019,2000,05C0,0800,0000,1242   ;2117    1241:    Q_Q-K[.1]
U 1242, 0019,2000,05C0,0800,0000,1243   ;2118    1242:    Q_Q-K[.1]
U 1243, 0019,2000,05C0,0800,0000,1244   ;2119    1243:    Q_Q-K[.1]
U 1244, 0019,2000,05C0,0800,0000,1245   ;2120    1244:    Q_Q-K[.1]
U 1245, 0019,2000,05C0,0800,0000,1246   ;2121    1245:    Q_Q-K[.1]
U 1246, 0019,2000,05C0,0800,0000,1247   ;2122    1246:    Q_Q-K[.1]
U 1247, 0019,2000,05C0,0800,0000,1248   ;2123    1247:    Q_Q-K[.1]
U 1248, 0019,2000,05C0,0800,0000,1249   ;2124    1248:    Q_Q-K[.1]
U 1249, 0019,2000,05C0,0800,0000,124A   ;2125    1249:    Q_Q-K[.1]
U 124A, 0019,2000,05C0,0800,0000,124B   ;2126    124A:    Q_Q-K[.1]
U 124B, 0019,2000,05C0,0800,0000,124C   ;2127    124B:    Q_Q-K[.1]
U 124C, 0019,2000,05C0,0800,0000,124D   ;2128    124C:    Q_Q-K[.1]
U 124D, 0019,2000,05C0,0800,0000,124E   ;2129    124D:    Q_Q-K[.1]
U 124E, 0019,2000,05C0,0800,0000,124F   ;2130    124E:    Q_Q-K[.1]
U 124F, 0019,2000,05C0,0800,0000,1250   ;2131    124F:    Q_Q-K[.1]
U 1250, 0019,2000,05C0,0800,0000,1251   ;2132    1250:    Q_Q-K[.1]
U 1251, 0019,2000,05C0,0800,0000,1252   ;2133    1251:    Q_Q-K[.1]
U 1252, 0019,2000,05C0,0800,0000,1253   ;2134    1252:    Q_Q-K[.1]
U 1253, 0019,2000,05C0,0800,0000,1254   ;2135    1253:    Q_Q-K[.1]
U 1254, 0019,2000,05C0,0800,0000,1255   ;2136    1254:    Q_Q-K[.1]
U 1255, 0019,2000,05C0,0800,0000,1256   ;2137    1255:    Q_Q-K[.1]
U 1256, 0019,2000,05C0,0800,0000,1257   ;2138    1256:    Q_Q-K[.1]
U 1257, 0019,2000,05C0,0800,0000,1258   ;2139    1257:    Q_Q-K[.1]
U 1258, 0019,2000,05C0,0800,0000,1259   ;2140    1258:    Q_Q-K[.1]
U 1259, 0019,2000,05C0,0800,0000,125A   ;2141    1259:    Q_Q-K[.1]
U 125A, 0019,2000,05C0,0800,0000,125B   ;2142    125A:    Q_Q-K[.1]
U 125B, 0019,2000,05C0,0800,0000,125C   ;2143    125B:    Q_Q-K[.1]
U 125C, 0019,2000,05C0,0800,0000,125D   ;2144    125C:    Q_Q-K[.1]
U 125D, 0019,2000,05C0,0800,0000,125E   ;2145    125D:    Q_Q-K[.1]
U 125E, 0019,2000,05C0,0800,0000,125F   ;2146    125E:    Q_Q-K[.1]
U 125F, 0019,2000,05C0,0800,0000,1260   ;2147    125F:    Q_Q-K[.1]
U 1260, 0019,2000,05C0,0800,0000,1261   ;2148    1260:    Q_Q-K[.1]
U 1261, 0019,2000,05C0,0800,0000,1262   ;2149    1261:    Q_Q-K[.1]
U 1262, 0019,2000,05C0,0800,0000,1263   ;2150    1262:    Q_Q-K[.1]
U 1263, 0019,2000,05C0,0800,0000,1264   ;2151    1263:    Q_Q-K[.1]
U 1264, 0019,2000,05C0,0800,0000,1265   ;2152    1264:    Q_Q-K[.1]
U 1265, 0019,2000,05C0,0800,0000,1266   ;2153    1265:    Q_Q-K[.1]
U 1266, 0019,2000,05C0,0800,0000,1267   ;2154    1266:    Q_Q-K[.1]
U 1267, 0019,2000,05C0,0800,0000,1268   ;2155    1267:    Q_Q-K[.1]
```

```
U 1268, 0019,2000,05C0,0800,0000,1269   ;2156    1268:    Q_Q-K[.1]
U 1269, 0019,2000,05C0,0800,0000,126A   ;2157    1269:    Q_Q-K[.1]
U 126A, 0019,2000,05C0,0800,0000,126B   ;2158    126A:    Q_Q-K[.1]
U 126B, 0019,2000,05C0,0800,0000,126C   ;2159    126B:    Q_Q-K[.1]
U 126C, 0019,2000,05C0,0800,0000,126D   ;2160    126C:    Q_Q-K[.1]
U 126D, 0019,2000,05C0,0800,0000,126E   ;2161    126D:    Q_Q-K[.1]
U 126E, 0019,2000,05C0,0800,0000,126F   ;2162    126E:    Q_Q-K[.1]
U 126F, 0019,2000,05C0,0800,0000,1270   ;2163    126F:    Q_Q-K[.1]
U 1270, 0019,2000,05C0,0800,0000,1271   ;2164    1270:    Q_Q-K[.1]
U 1271, 0019,2000,05C0,0800,0000,1272   ;2165    1271:    Q_Q-K[.1]
U 1272, 0019,2000,05C0,0800,0000,1273   ;2166    1272:    Q_Q-K[.1]
U 1273, 0019,2000,05C0,0800,0000,1274   ;2167    1273:    Q_Q-K[.1]
U 1274, 0019,2000,05C0,0800,0000,1275   ;2168    1274:    Q_Q-K[.1]
U 1275, 0019,2000,05C0,0800,0000,1276   ;2169    1275:    Q_Q-K[.1]
U 1276, 0019,2000,05C0,0800,0000,1277   ;2170    1276:    Q_Q-K[.1]
U 1277, 0019,2000,05C0,0800,0000,1278   ;2171    1277:    Q_Q-K[.1]
U 1278, 0019,2000,05C0,0800,0000,1279   ;2172    1278:    Q_Q-K[.1]
U 1279, 0019,2000,05C0,0800,0000,127A   ;2173    1279:    Q_Q-K[.1]
U 127A, 0019,2000,05C0,0800,0000,127B   ;2174    127A:    Q_Q-K[.1]
U 127B, 0019,2000,05C0,0800,0000,127C   ;2175    127B:    Q_Q-K[.1]
U 127C, 0019,2000,05C0,0800,0000,127D   ;2176    127C:    Q_Q-K[.1]
U 127D, 0019,2000,05C0,0800,0000,127E   ;2177    127D:    Q_Q-K[.1]
U 127E, 0019,2000,05C0,0800,0000,127F   ;2178    127E:    Q_Q-K[.1]
U 127F, 0019,2000,05C0,0800,0000,1280   ;2179    127F:    Q_Q-K[.1]
U 1280, 0019,2000,05C0,0800,0000,1281   ;2180    1280:    Q_Q-K[.1]
U 1281, 0019,2000,05C0,0800,0000,1282   ;2181    1281:    Q_Q-K[.1]
U 1282, 0019,2000,05C0,0800,0000,1283   ;2182    1282:    Q_Q-K[.1]
U 1283, 0019,2000,05C0,0800,0000,1284   ;2183    1283:    Q_Q-K[.1]
U 1284, 0019,2000,05C0,0800,0000,1285   ;2184    1284:    Q_Q-K[.1]
U 1285, 0019,2000,05C0,0800,0000,1286   ;2185    1285:    Q_Q-K[.1]
U 1286, 0019,2000,05C0,0800,0000,1287   ;2186    1286:    Q_Q-K[.1]
U 1287, 0019,2000,05C0,0800,0000,1288   ;2187    1287:    Q_Q-K[.1]
U 1288, 0019,2000,05C0,0800,0000,1289   ;2188    1288:    Q_Q-K[.1]
U 1289, 0019,2000,05C0,0800,0000,128A   ;2189    1289:    Q_Q-K[.1]
U 128A, 0019,2000,05C0,0800,0000,128B   ;2190    128A:    Q_Q-K[.1]
U 128B, 0019,2000,05C0,0800,0000,128C   ;2191    128B:    Q_Q-K[.1]
U 128C, 0019,2000,05C0,0800,0000,128D   ;2192    128C:    Q_Q-K[.1]
U 128D, 0019,2000,05C0,0800,0000,128E   ;2193    128D:    Q_Q-K[.1]
U 128E, 0019,2000,05C0,0800,0000,128F   ;2194    128E:    Q_Q-K[.1]
U 128F, 0019,2000,05C0,0800,0000,1290   ;2195    128F:    Q_Q-K[.1]
U 1290, 0019,2000,05C0,0800,0000,1291   ;2196    1290:    Q_Q-K[.1]
U 1291, 0019,2000,05C0,0800,0000,1292   ;2197    1291:    Q_Q-K[.1]
U 1292, 0019,2000,05C0,0800,0000,1293   ;2198    1292:    Q_Q-K[.1]
U 1293, 0019,2000,05C0,0800,0000,1294   ;2199    1293:    Q_Q-K[.1]
U 1294, 0019,2000,05C0,0800,0000,1295   ;2200    1294:    Q_Q-K[.1]
U 1295, 0019,2000,05C0,0800,0000,1296   ;2201    1295:    Q_Q-K[.1]
U 1296, 0019,2000,05C0,0800,0000,1297   ;2202    1296:    Q_Q-K[.1]
U 1297, 0019,2000,05C0,0800,0000,1298   ;2203    1297:    Q_Q-K[.1]
U 1298, 0019,2000,05C0,0800,0000,1299   ;2204    1298:    Q_Q-K[.1]
U 1299, 0019,2000,05C0,0800,0000,129A   ;2205    1299:    Q_Q-K[.1]
U 129A, 0019,2000,05C0,0800,0000,129B   ;2206    129A:    Q_Q-K[.1]
U 129B, 0019,2000,05C0,0800,0000,129C   ;2207    129B:    Q_Q-K[.1]
U 129C, 0019,2000,05C0,0800,0000,129D   ;2208    129C:    Q_Q-K[.1]
U 129D, 0019,2000,05C0,0800,0000,129E   ;2209    129D:    Q_Q-K[.1]
U 129E, 0019,2000,05C0,0800,0000,129F   ;2210    129E:    Q_Q-K[.1]
```

```
U 129F, 0019,2000,05C0,0800,0000,12A0   ;2211   129F:   Q_Q-K[.1]
U 12A0, 0019,2000,05C0,0800,0000,12A1   ;2212   12A0:   Q_Q-K[.1]
U 12A1, 0019,2000,05C0,0800,0000,12A2   ;2213   12A1:   Q_Q-K[.1]
U 12A2, 0019,2000,05C0,0800,0000,12A3   ;2214   12A2:   Q_Q-K[.1]
U 12A3, 0019,2000,05C0,0800,0000,12A4   ;2215   12A3:   Q_Q-K[.1]
U 12A4, 0019,2000,05C0,0800,0000,12A5   ;2216   12A4:   Q_Q-K[.1]
U 12A5, 0019,2000,05C0,0800,0000,12A6   ;2217   12A5:   Q_Q-K[.1]
U 12A6, 0019,2000,05C0,0800,0000,12A7   ;2218   12A6:   Q_Q-K[.1]
U 12A7, 0019,2000,05C0,0800,0000,12A8   ;2219   12A7:   Q_Q-K[.1]
U 12A8, 0019,2000,05C0,0800,0000,12A9   ;2220   12A8:   Q_Q-K[.1]
U 12A9, 0019,2000,05C0,0800,0000,12AA   ;2221   12A9:   Q_Q-K[.1]
U 12AA, 0019,2000,05C0,0800,0000,12AB   ;2222   12AA:   Q_Q-K[.1]
U 12AB, 0019,2000,05C0,0800,0000,12AC   ;2223   12AB:   Q_Q-K[.1]
U 12AC, 0019,2000,05C0,0800,0000,12AD   ;2224   12AC:   Q_Q-K[.1]
U 12AD, 0019,2000,05C0,0800,0000,12AE   ;2225   12AD:   Q_Q-K[.1]
U 12AE, 0019,2000,05C0,0800,0000,12AF   ;2226   12AE:   Q_Q-K[.1]
U 12AF, 0019,2000,05C0,0800,0000,12B0   ;2227   12AF:   Q_Q-K[.1]
U 12B0, 0019,2000,05C0,0800,0000,12B1   ;2228   12B0:   Q_Q-K[.1]
U 12B1, 0019,2000,05C0,0800,0000,12B2   ;2229   12B1:   Q_Q-K[.1]
U 12B2, 0019,2000,05C0,0800,0000,12B3   ;2230   12B2:   Q_Q-K[.1]
U 12B3, 0019,2000,05C0,0800,0000,12B4   ;2231   12B3:   Q_Q-K[.1]
U 12B4, 0019,2000,05C0,0800,0000,12B5   ;2232   12B4:   Q_Q-K[.1]
U 12B5, 0019,2000,05C0,0800,0000,12B6   ;2233   12B5:   Q_Q-K[.1]
U 12B6, 0019,2000,05C0,0800,0000,12B7   ;2234   12B6:   Q_Q-K[.1]
U 12B7, 0019,2000,05C0,0800,0000,12B8   ;2235   12B7:   Q_Q-K[.1]
U 12B8, 0019,2000,05C0,0800,0000,12B9   ;2236   12B8:   Q_Q-K[.1]
U 12B9, 0019,2000,05C0,0800,0000,12BA   ;2237   12B9:   Q_Q-K[.1]
U 12BA, 0019,2000,05C0,0800,0000,12BB   ;2238   12BA:   Q_Q-K[.1]
U 12BB, 0019,2000,05C0,0800,0000,12BC   ;2239   12BB:   Q_Q-K[.1]
U 12BC, 0019,2000,05C0,0800,0000,12BD   ;2240   12BC:   Q_Q-K[.1]
U 12BD, 0019,2000,05C0,0800,0000,12BE   ;2241   12BD:   Q_Q-K[.1]
U 12BE, 0019,2000,05C0,0800,0000,12BF   ;2242   12BE:   Q_Q-K[.1]
U 12BF, 0019,2000,05C0,0800,0000,12C0   ;2243   12BF:   Q_Q-K[.1]
U 12C0, 0019,2000,05C0,0800,0000,12C1   ;2244   12C0:   Q_Q-K[.1]
U 12C1, 0019,2000,05C0,0800,0000,12C2   ;2245   12C1:   Q_Q-K[.1]
U 12C2, 0019,2000,05C0,0800,0000,12C3   ;2246   12C2:   Q_Q-K[.1]
U 12C3, 0019,2000,05C0,0800,0000,12C4   ;2247   12C3:   Q_Q-K[.1]
U 12C4, 0019,2000,05C0,0800,0000,12C5   ;2248   12C4:   Q_Q-K[.1]
U 12C5, 0019,2000,05C0,0800,0000,12C6   ;2249   12C5:   Q_Q-K[.1]
U 12C6, 0019,2000,05C0,0800,0000,12C7   ;2250   12C6:   Q_Q-K[.1]
U 12C7, 0019,2000,05C0,0800,0000,12C8   ;2251   12C7:   Q_Q-K[.1]
U 12C8, 0019,2000,05C0,0800,0000,12C9   ;2252   12C8:   Q_Q-K[.1]
U 12C9, 0019,2000,05C0,0800,0000,12CA   ;2253   12C9:   Q_Q-K[.1]
U 12CA, 0019,2000,05C0,0800,0000,12CB   ;2254   12CA:   Q_Q-K[.1]
U 12CB, 0019,2000,05C0,0800,0000,12CC   ;2255   12CB:   Q_Q-K[.1]
U 12CC, 0019,2000,05C0,0800,0000,12CD   ;2256   12CC:   Q_Q-K[.1]
U 12CD, 0019,2000,05C0,0800,0000,12CE   ;2257   12CD:   Q_Q-K[.1]
U 12CE, 0019,2000,05C0,0800,0000,12CF   ;2258   12CE:   Q_Q-K[.1]
U 12CF, 0019,2000,05C0,0800,0000,12D0   ;2259   12CF:   Q_Q-K[.1]
U 12D0, 0019,2000,05C0,0800,0000,12D1   ;2260   12D0:   Q_Q-K[.1]
U 12D1, 0019,2000,05C0,0800,0000,12D2   ;2261   12D1:   Q_Q-K[.1]
U 12D2, 0019,2000,05C0,0800,0000,12D3   ;2262   12D2:   Q_Q-K[.1]
U 12D3, 0019,2000,05C0,0800,0000,12D4   ;2263   12D3:   Q_Q-K[.1]
U 12D4, 0019,2000,05C0,0800,0000,12D5   ;2264   12D4:   Q_Q-K[.1]
U 12D5, 0019,2000,05C0,0800,0000,12D6   ;2265   12D5:   Q_Q-K[.1]
```

```
U 12D6, 0019,2000,05C0,0800,0000,12D7    ;2266   12D6:    Q_Q-K[.1]
U 12D7, 0019,2000,05C0,0800,0000,12D8    ;2267   12D7:    Q_Q-K[.1]
U 12D8, 0019,2000,05C0,0800,0000,12D9    ;2268   12D8:    Q_Q-K[.1]
U 12D9, 0019,2000,05C0,0800,0000,12DA    ;2269   12D9:    Q_Q-K[.1]
U 12DA, 0019,2000,05C0,0800,0000,12DB    ;2270   12DA:    Q_Q-K[.1]
U 12DB, 0019,2000,05C0,0800,0000,12DC    ;2271   12DB:    Q_Q-K[.1]
U 12DC, 0019,2000,05C0,0800,0000,12DD    ;2272   12DC:    Q_Q-K[.1]
U 12DD, 0019,2000,05C0,0800,0000,12DE    ;2273   12DD:    Q_Q-K[.1]
U 12DE, 0019,2000,05C0,0800,0000,12DF    ;2274   12DE:    Q_Q-K[.1]
U 12DF, 0019,2000,05C0,0800,0000,12E0    ;2275   12DF:    Q_Q-K[.1]
U 12E0, 0019,2000,05C0,0800,0000,12E1    ;2276   12E0:    Q_Q-K[.1]
U 12E1, 0019,2000,05C0,0800,0000,12E2    ;2277   12E1:    Q_Q-K[.1]
U 12E2, 0019,2000,05C0,0800,0000,12E3    ;2278   12E2:    Q_Q-K[.1]
U 12E3, 0019,2000,05C0,0800,0000,12E4    ;2279   12E3:    Q_Q-K[.1]
U 12E4, 0019,2000,05C0,0800,0000,12E5    ;2280   12E4:    Q_Q-K[.1]
U 12E5, 0019,2000,05C0,0800,0000,12E6    ;2281   12E5:    Q_Q-K[.1]
U 12E6, 0019,2000,05C0,0800,0000,12E7    ;2282   12E6:    Q_Q-K[.1]
U 12E7, 0019,2000,05C0,0800,0000,12E8    ;2283   12E7:    Q_Q-K[.1]
U 12E8, 0019,2000,05C0,0800,0000,12E9    ;2284   12E8:    Q_Q-K[.1]
U 12E9, 0019,2000,05C0,0800,0000,12EA    ;2285   12E9:    Q_Q-K[.1]
U 12EA, 0019,2000,05C0,0800,0000,12EB    ;2286   12EA:    Q_Q-K[.1]
U 12EB, 0019,2000,05C0,0800,0000,12EC    ;2287   12EB:    Q_Q-K[.1]
U 12EC, 0019,2000,05C0,0800,0000,12ED    ;2288   12EC:    Q_Q-K[.1]
U 12ED, 0019,2000,05C0,0800,0000,12EE    ;2289   12ED:    Q_Q-K[.1]
U 12EE, 0019,2000,05C0,0800,0000,12EF    ;2290   12EE:    Q_Q-K[.1]
U 12EF, 0019,2000,05C0,0800,0000,12F0    ;2291   12EF:    Q_Q-K[.1]
U 12F0, 0019,2000,05C0,0800,0000,12F1    ;2292   12F0:    Q_Q-K[.1]
U 12F1, 0019,2000,05C0,0800,0000,12F2    ;2293   12F1:    Q_Q-K[.1]
U 12F2, 0019,2000,05C0,0800,0000,12F3    ;2294   12F2:    Q_Q-K[.1]
U 12F3, 0019,2000,05C0,0800,0000,12F4    ;2295   12F3:    Q_Q-K[.1]
U 12F4, 0019,2000,05C0,0800,0000,12F5    ;2296   12F4:    Q_Q-K[.1]
U 12F5, 0019,2000,05C0,0800,0000,12F6    ;2297   12F5:    Q_Q-K[.1]
U 12F6, 0019,2000,05C0,0800,0000,12F7    ;2298   12F6:    Q_Q-K[.1]
U 12F7, 0019,2000,05C0,0800,0000,12F8    ;2299   12F7:    Q_Q-K[.1]
U 12F8, 0019,2000,05C0,0800,0000,12F9    ;2300   12F8:    Q_Q-K[.1]
U 12F9, 0019,2000,05C0,0800,0000,12FA    ;2301   12F9:    Q_Q-K[.1]
U 12FA, 0019,2000,05C0,0800,0000,12FB    ;2302   12FA:    Q_Q-K[.1]
U 12FB, 0019,2000,05C0,0800,0000,12FC    ;2303   12FB:    Q_Q-K[.1]
U 12FC, 0019,2000,05C0,0800,0000,12FD    ;2304   12FC:    Q_Q-K[.1]
U 12FD, 0019,2000,05C0,0800,0000,12FE    ;2305   12FD:    Q_Q-K[.1]
U 12FE, 0019,2000,05C0,0800,0000,12FF    ;2306   12FE:    Q_Q-K[.1]
U 12FF, 0019,2002,05C0,0800,0000,0001    ;2307   12FF:    Q_Q-K[.1],RETURN1
                                         ;2308
                                         ;2309
                                         ;2310   ;+
                                         ;2311   ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
                                         ;2312   ; CACHE REFERANCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
                                         ;2313   ; IS COMPLETELY FULL OF DATA.
                                         ;2314   ;
                                         ;2315   ; BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
                                         ;2316   ;-
                                         ;2317
U 119D, 3000,003C,0180,6000,0000,119E    ;2318   IBWAIT: LOAD.IB,IBC/START
U 119E, 0000,003C,0180,F800,0000,119F    ;2319           MCT/ALLOW.IB.READ
U 119F, 0000,003C,0180,F800,0000,11A0    ;2320           MCT/ALLOW.IB.READ
```

```
U 11A0, 0000,003C,0180,F800,0000,11A1    ;2321          MCT/ALLOW.IB.READ
U 11A1, 0000,003C,0180,F800,0000,11A2    ;2322          MCT/ALLOW.IB.READ
U 11A2, 0000,003C,0180,F800,0000,11A3    ;2323          MCT/ALLOW.IB.READ
U 11A3, 1000,003E,0180,F800,0000,0001    ;2324          MCT/ALLOW.IB.READ,IBC/STOP,RETURN1
                                         ;2325
                                         ;2326
                                         ;2327   ;+
                                         ;2328   ; THIS SUBROUTINE EXECUTE AN SBI UNJAM SEQUENCE
                                         ;2329   ;-
                                         ;2330
U 11A4, 0F00,003C,0180,0800,0000,11A5    ;2331   UNJAM:  D_0
U 11A5, 0000,003C,7580,3C00,0000,11A6    ;2332           ID[MAINT]_D                       ; RELOAD THE MAT REG
U 11A6, 0F00,003C,0180,8000,0000,11A7    ;2333           D_0,MCT/SBI.HOLD                  ; ASSERT HOLD FOR 16 CYCLES
U 11A7, 0019,0020,6180,8000,0010,11A8    ;2334   UNJAM0: A[U_D[XOR]K[.F],CLK.UBCC,MCT/SBI.HOLD ; DONE YET?
U 11A8, 0000,013C,0180,8000,0000,1018    ;2335           Z?,MCT/SBI.HOLD                   ; BRANCH IF YES
U 1018, 0819,0014,0580,8000,0000,11A7    ;2336   =0      D_D+K[.1],MCT/SBI.HOLD,J/UNJAM0 ; CONTINUE HOLDING THE BUS
                                         ;2337
U 1019, 0F00,003C,0180,8800,0000,11A9    ;2338           D_0,MCT/SBI.HOLD+UNJAM            ; ASSERT HOLD AND UNJAM FOR 16 CYCLES
U 11A9, 0019,0020,6180,8800,0010,11AA    ;2339   UNJAM1: A[U_D[XOR]K[.F],CLK.UBCC,MCT/SBI.HOLD+UNJAM ; DONE YET?
U 11AA, 0000,013C,0180,8800,0000,101A    ;2340           Z?,MCT/SBI.HOLD+UNJAM             ; BRANCH IF YES
U 101A, 0819,0014,0580,8800,0000,11A9    ;2341   =0      D_D+K[.1],MCT/SBI.HOLD+UNJAM,J/UNJAM1 ; CONTINUE UNJAM
                                         ;2342
U 101B, 0F00,003C,0180,8000,8000,11AB    ;2343           D_0,MCT/SBI.HOLD,INTRPT.ACK       ; ASSERT HOLD FOR 16 CYCLES
U 11AB, 0019,0020,6180,8000,0010,11AC    ;2344   UNJAM2: A[U_D[XOR]K[.F],MCT/SBI.HOLD,CLK.UBCC ; DONE YET?
U 11AC, 0000,013C,0180,8000,0000,101C    ;2345           Z?,MCT/SBI.HOLD                   ; BRANCH IF YES
U 101C, 0819,0014,0580,8000,0000,11AB    ;2346   =0      D_D+K[.1],MCT/SBI.HOLD,J/UNJAM2 ; CONTINUE HOLDING
                                         ;2347
U 101D, 0000,003C,8580,0800,0084,71AD    ;2348           SC_K[.C]
U 11AD, 0803,001C,0180,0800,4000,11AE    ;2349           D_NOT.MASK,INTRPT.STROBE
U 11AE, 0000,003E,7580,3C00,0000,0001    ;2350           ID[MAINT]_D,RETURN1               ; TURN OFF THE SBI
                                         ;2351
                                         ;2352
```

```
.PAGE   "TEST 161       INTERVAL COUNTER"
;*********************************************************************
;++
; TEST  161     INTERVAL COUNTER
;
; TEST DESCRIPTION
;       THIS TEST CHECKS THE DATA INTEGRITY AND THE FUNCTIONALITY OF THE
;       INTERVAL COUNTER.
;
;       SUBTST 1 - FLOAT A ZERO THRU THE NEXT INTERVAL REGISTER, LOAD THE
;                  INTERVAL REGISTER USING THE "TRANSFER" BIT IN THE CONTROL
;                  AND STATUS REGISTER, AND READ AND CHECK THE INTERVAL REGISTER.
;       SUBTST 2 - SAME AS SUBTST 1 EXCEPT WITH A FLOATING 1 TEST PATTERN.
;       SUBTST 3 - CHECK THAT THE CARRY PROPAGATION ON THE INTERVAL REGISTER
;                  WORKS BY LOADING THE INTERVAL REGISTER WITH ALL ONES,
;                  STEPPING THE COUNTER, WITH THE SINGLE STEP BIT, AND
;                  CHECKING THAT THE INTERVAL REGISTER ROLLED OVER TO ZERO.
;       SUBTST 4 - CHECK THAT THE INTERRUPT ENABLE BIT IN THE CONTROL AND
;                  STATUS REGISTER CAN BE SET AND CLEARED.
;       SUBTST 5 - CHECK THE DIVIDE BY 5 COUNTER THAT CONTROLS THE INCREMENT
;                  OF THE INTERVAL REGISTER AND THE RUN BIT IN THE CONTROL
;                  AND STATUS REGISTER BY LOADING THE INTERVAL REGISTER
;                  WITH ZERO, STARTING THE COUNTER, WAITING 8 CYCLES FOR THE
;                  COUNTER TO INCREMENT TWICE, STOPPING THE COUNTER, AND
;                  CHECKING THAT THE INTERVAL REGISTER INCREMENTED TWICE
;                  AND THAT THE RUN BIT SET AND CLEARED.
;       SUBTST 6 - CHECK THE AUTO RELOAD FUNCTION AND THE INTERRUPT REQUEST
;                  BIT BY LOADING THE INTERVAL REGISTER WITH ALL ONES,
;                  LOADING THE NEXT INTERVAL REGISTER WITH 3F, STARTING THE
;                  COUNTER AND WAITING 3 CYCLES, STOPPING THE COUNTER AND
;                  CHECKING THE INTERVAL REGISTER FOR 3F AND THE INTERRUPT
;                  REQUEST BIT SHOULD BE SET. THEN THE INTERRUPT REQUEST BIT
;                  IS WRITTEN AS A ONE TO ENSURE IT CLEARS.
;       SUBTST 7 - CHECK THAT THE ERROR BIT SETS AND CLEARS CORRECTLY BY
;                  LOADING THE INTERVAL REGISTER WITH -2, STARTING THE COUNTER
;                  AND WAITING 17 CYCLES FOR RELOAD TO OCCUR TWICE,
;                  STOPPING THE COUNTER AND CHECKING THAT THE ERROR BIT SET.
;                  THE ERROR BIT IS THEN WRITTEN AS A ONE TO ENSURE IT CLEARS.
;
; LOGIC DESCRIPTION
;       THIS TEST CHECKS THE INTERVAL COUNTER LOGIC ON THE CEH AND ICL
;       MODULES. IT ALSO CHECKS THE ID BUS INTERFACE TO THE NEXT INTERVAL
;       AND INTERVAL REGISTERS.
;
; ERROR DESCRIPTION
;       DATA: EXPECTED REGISTER CONTENTS (THE REGISTER DEPENDS ON THE SUBTEST)
;             RECEIVED REGISTER CONTENTS
;             LOOP COUNT -- SUBTESTS 1,2, AND 4 ONLY.
;               INDICATES THE DATA PATTERN BEING LOADED INTO THE INTERVAL COUNTER.
;
; SYNC POINT DESCRIPTION
;       SUBTST 1 - SYNC26--NEXT INTERVAL REGISTER GETS LOADED
;                  SYNC27--INTERVAL REGISTER GETS LOADED
;                  SYNC28--INTERVAL REGISTER IS READ ON THE ID BUS
;       SUBTST 2 - SYNC29--NEXT INTERVAL REGISTER GETS LOADED
```

```
                                        ;2408   ;                 SYNC2A--INTERVAL REGISTER GETS LOADED
                                        ;2409   ;                 SYNC2B--INTERVAL REGISTER IS READ ON THE ID BUS
                                        ;2410   ;       SUBTST 3 - SYNC2C--INTERVAL REGISTER IS CLOCKED WITH SINGLE CLOCK BIT
                                        ;2411   ;       SUBTST 4 - SYNC2D--INTERRUPT ENABLE BIT GETS LOADED
                                        ;2412   ;                 SYNC2E--INTERRUPT ENABLE BIT GETS READ ON THE ID BUS
                                        ;2413   ;       SUBTST 5 - SYNC31--RUN BIT SETS IN THE CONTROL AND STATUS REGISTER
                                        ;2414   ;                 SYNC32--INTERVAL REGISTER CLOCKS THE FIRST TIME
                                        ;2415   ;                 SYNC33--INTERVAL REGISTER CLOCKS THE SECOND TIME
                                        ;2416   ;                 SYNC34--RUN BIT IS CLEARED IN THE CONTROL AND STATUS REG
                                        ;2417   ;       SUBTST 6 - SYNC35--INTERVAL REGISTER RELOADS FROM THE NEXT INT REG
                                        ;2418   ;       SUBTST 7 - SYNC36--ERROR BIT SETS IN THE CONTROL AND STATUS REG
                                        ;2419   ;                 SYNC37--ERROR BIT CLEARS
                                        ;2420   ;--
                                        ;2421   ;*************************************************************************
                                        ;2422   =0
U 1020, 0018,0039,0D80,09F8,0000,116D   ;2423   T161:   NEWTST[.3]
                                        ;2424
                                        ;2425   ;/////////////////////////////////////////////////////////////////////////
                                        ;2426
                                        ;2427   ;+
                                        ;2428   ; NOW FLOAT A ZERO THRU THE NEXT INTERVAL AND INTERVAL COUNTER REGISTERS
                                        ;2429   ;-
                                        ;2430
U 1021, 0818,0038,F180,0800,0000,11AF   ;2431   T161S1: D_K[.FFFC]                          ; GENERATE INITIAL PATTERN
U 11AF, 081A,4014,0980,0800,0000,11B0   ;2432           D_D.SXT[WORD]+K[.2]                 ; GENERATE INITIAL PATTERN
U 11B0, 0001,003C,0180,09F0,0000,1022   ;2433           RC[0E]_D
U 1022, 0000,003D,0180,0800,0000,1189   ;2434   =0      SUBTEST
U 1023, 0018,0038,7580,09E0,0000,1024   ;2435           RC[0C]_K[.20]                       ; SET THE LOOP COUNT
U 1024, 0000,003D,0180,0800,0000,1181   ;2436   =0      ERLOOP
U 1025, 0810,0038,0180,0970,0000,11B1   ;2437   T161L2: D_RC[0E]                            ; GET THE TEST PATTERN
U 11B1, 0000,003C,2580,3C00,0000,11B2   ;2438   SYNC26: ID[NXT.PER]_D                       ; WRITE THE NEXT INTERVAL REG
U 11B2, 0818,0038,6580,0800,0000,11B3   ;2439           D_K[.10]
U 11B3, 0000,003C,2980,3C00,0000,11B4   ;2440   SYNC27: ID[CLK.CS]_D                        ; LOAD THE INTERVAL COUNTER
U 11B4, 0810,0038,2DF0,2D70,0000,11B5   ;2441   SYNC28: Q_ID[INTERVAL],D_RC[0E]             ; READ THE INTERVAL COUNTER
U 11B5, 001D,2000,0180,0800,0010,11B6   ;2442           ALU_Q-D,CLK.UBCC                    ; CHECK
U 11B6, 0000,013C,0180,0800,0000,1028   ;2443           Z?
U 1028, 0001,203D,0180,09E8,0000,1184   ;2444   =0      ERROR2,RC[0D]_Q                     ; BIT STUCK IN INTERVAL COUNTER REG
U 1029, 0010,0038,01C0,0970,0000,11B7   ;2445           Q_RC[0E]                            ; GENERATE THE NEXT PATTERN
U 11B7, 0000,003C,03A8,0800,0000,11B8   ;2446           Q_Q.LEFT,SI/MUL-
U 11B8, 0001,203C,0180,09F0,0000,11B9   ;2447           RC[0E]_Q                            ; SAVE
U 11B9, 0810,0038,0180,0960,0000,11BA   ;2448           D_RC[0C]
U 11BA, 0019,8000,0580,09E0,0010,11BB   ;2449           RC[0C]_D-K[.1],CLK.UBCC,BYTE        ; CHECK THE LOOP COUNT
U 11BB, 0000,013C,0180,0800,0000,102A   ;2450           Z?
U 102A, 0000,003C,0180,0800,0000,1025   ;2451   =0      J/T161L2                            ; CONTINUE
                                        ;2452
                                        ;2453   ;/////////////////////////////////////////////////////////////////////////
                                        ;2454
                                        ;2455   ;+
                                        ;2456   ; FLOAT A ONE THRU THE NEXT INTERVAL AND INTERVAL REGISTERS
                                        ;2457   ;-
                                        ;2458
U 102B, 0018,0038,0580,09F0,0000,102C   ;2459   T161S2: RC[0E]_K[.1]                        ; INITIALIZE THE TEST PATTERN
U 102C, 0000,003D,0180,0800,0000,1189   ;2460   =0      SUBTEST
U 102D, 0018,0038,7580,09E0,0000,1030   ;2461           RC[0C]_K[.20]                       ; SET THE LOOP COUNT
U 1030, 0000,003D,0180,0800,0000,1181   ;2462   =0      ERLOOP
```

```
U 1031, 0810,0038,0180,0970,0000,11BC   ;2463   T161L1: D_RC[0E]                         ; GET THE TEST PATTERN
U 11BC, 0000,003C,2580,3C00,0000,11BD   ;2464   SYNC29: ID[NXT.PER]_D                    ; WRITE NEXT INTERVAL REG
U 11BD, 0818,0038,6580,0800,0000,11BE   ;2465           D_K[.10]
U 11BE, 0000,003C,2980,3C00,0000,11BF   ;2466   SYNC2A: ID[CLK.CS]_D                     ; LOAD THE INTERVAL COUNTER REG
U 11BF, 0810,0038,2DF0,2D70,0000,11C0   ;2467   SYNC2B: Q_ID[INTERVAL],D_RC[0E]          ; READ THE REGISTER
U 11C0, 001D,2000,0180,0800,0010,11C1   ;2468           A[U_Q-D,CLK.UBCC                 ; CHECK
U 11C1, 0000,013C,0180,0800,0000,1032   ;2469           Z?
U 1032, 0001,203D,0180,09E8,0000,1184   ;2470   =0      ERROR2,RC[0D]_Q                  ; BIT STUCK IN INTERVAL COUNTER REG
U 1033, 0810,0038,0180,0970,0000,11C2   ;2471           D_RC[0E]                         ; GENERATE NEXT PATTERN
U 11C2, 0500,003C,0180,0800,0000,11C3   ;2472           D_D.LEFT                         ; ...
U 11C3, 0001,003C,0180,09F0,0000,11C4   ;2473           RC[0E]_D                         ; ...
U 11C4, 0810,0038,0180,0960,0000,11C5   ;2474           D_RC[0C]
U 11C5, 0019,8000,0580,09E0,0010,11C6   ;2475           RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; CHECK THE LOOP COUNT
U 11C6, 0000,013C,0180,0800,0000,1034   ;2476           Z?
U 1034, 0000,003C,0180,0800,0000,1031   ;2477   =0      J/T161L1                         ; CONTINUE
                                        ;2478
                                        ;2479
                                        ;2480   ;/////////////////////////////////////////////////////////////////////
                                        ;2481
                                        ;2482   ;+
                                        ;2483   ; NOW CHECK THAT THE CARRYS ON THE INTERVAL COUNTER ARE OK AND THAT THE
                                        ;2484   ; SINGLE STEP FUNCTION WORKS
                                        ;2485   ;-
                                        ;2486
U 1035, 001B,0000,0580,0A88,0000,1038   ;2487   T161S3: R[1]_0-K[.1]                     ; GENERATE A MINUS ONE
U 1038, 0000,003D,0180,0800,0000,1189   ;2488   =0      SUBTEST
U 1039, 0F03,003C,0180,09F0,0000,103A   ;2489           RC[0E]_0,D_0                     ; SET THE EXPECTED VALUE
U 103A, 0000,003D,0980,0800,0084,718B   ;2490   =0      SETRCF[.2]
U 103B, 0000,003C,2580,3C00,0000,11C7   ;2491           ID[NXT.PER]_D                    ; SET NEXT INTERVAL REG TO 0
U 11C7, 0818,0038,6580,0800,0000,11C8   ;2492           D_K[.10]
U 11C8, 0000,003C,2980,3C00,0000,11C9   ;2493           ID[CLK.CS]_D                     ; LOAD INTERVAL REG
U 11C9, 0818,0038,0580,0800,0000,11CA   ;2494           D_K[.1]
U 11CA, 0000,003C,2980,3C00,0000,11CB   ;2495           ID[CLK.CS]_D                     ; SATRT THE CLOCK
                                        ;2496   ;+
                                        ;2497   ; WAIT FOR THE RELOAD FLIP FLOP TO CLEAR
                                        ;2498   ;-
                                        ;2499
U 11CB, 0000,003C,0180,0800,0000,11CC   ;2500           NOP
U 11CC, 0000,003C,0180,0800,0000,11CD   ;2501           NOP
U 11CD, 0000,003C,0180,0800,0000,11CE   ;2502           NOP
U 11CE, 0000,003C,0180,0800,0000,11CF   ;2503           NOP
U 11CF, 0F00,003C,0180,0800,0000,11D0   ;2504           D_0
U 11D0, 0000,003C,2980,3C00,0000,11D1   ;2505           ID[CLK.CS]_D                     ; STOP THE CLOCK
                                        ;2506
                                        ;2507   ;
U 11D1, 081B,0000,0580,0800,0000,11D2   ;2508           D_0-K[.1]
U 11D2, 0000,003C,2580,3C00,0000,103C   ;2509           ID[NXT.PER]_D                    ; LOAD THE MINUS ONE INTO NEXT INTERVAL
U 103C, 0000,003D,0180,0800,0000,1181   ;2510   =0      ERLOOP
U 103D, 0018,0038,75C0,0800,0000,11D3   ;2511           Q_K[.20]                         ; GET DATA TO STEP THE COUNTER
U 11D3, 0818,0038,6580,0800,0000,11D4   ;2512           D_K[.10]
U 11D4, 0C00,003C,2980,3C00,0000,11D5   ;2513           ID[CLK.CS]_D,D_Q                 ; LOAD THE MINUS ONE INTO INTERVAL CNTR
U 11D5, 0000,003C,2980,3C00,0000,11D6   ;2514   SYNC2C: ID[CLK.CS]_D                     ; STEP THE COUNTER
U 11D6, 0F00,003C,2DF0,2C00,0000,11D7   ;2515           Q_ID[INTERVAL],D_0               ; READ THE INTERVAL REG
U 11D7, 001D,2000,0180,0800,0010,11D8   ;2516           A[U_Q-D,CLK.UBCC                 ; CHECK THAT IT WENT TO ZERO
U 11D8, 0000,013C,0180,0800,0000,103E   ;2517           Z?
```

```
U 103E, 0001,203D,0180,09E8,0000,1184   ;2518   =0      ERROR2,RC[0D]_Q                     ; INTERVAL COUNTER DID NOT GO TO ZERO
                                        ;2519
                                        ;2520
                                        ;2521   ;//////////////////////////////////////////////////////////////////////
                                        ;2522
                                        ;2523   ;+
                                        ;2524   ; CHECK THE INTERRUPT ENABLE BIT IN THE CONTROL AND STATUS REGISTER
                                        ;2525   ;-
                                        ;2526
U 103F, 0018,0038,0980,09E0,0000,1040   ;2527   T161S4: RC[0C]_K[.2]                        ; SET THE LOOP COUNT
U 1040, 0000,003D,0180,0800,0000,1189   ;2528   =0      SUBTEST
U 1041, 0000,003C,0180,0800,0000,1042   ;2529           NOP
U 1042, 0000,003D,0D80,0800,0084,7188   ;2530   =0      SETRCF[.3]
U 1043, 0018,0038,3180,09F0,0000,1044   ;2531           RC[0E]_K[.40]                       ; SET THE EXPECTED DATA
U 1044, 0000,003D,0180,0800,0000,1181   ;2532   =0      ERLOOP
U 1045, 0810,0038,0180,0970,0000,11D9   ;2533   T161L3: D_RC[0E]                            ; GET THE TEST PATTERN
U 11D9, 0000,003C,2980,3C00,0000,11DA   ;2534   SYNC2D: ID[CLK.CS]_D                        ; WRITE THE IE BIT
U 11DA, 0810,0038,29F0,2D70,0000,11DB   ;2535   SYNC2E: Q_ID[CLK.CS],D_RC[0E]               ; READ IT BACK
U 11DB, 0019,2034,31C0,0800,0000,11DC   ;2536           Q_Q.AND.K[.40]                      ; MASK
U 11DC, 001D,2000,0180,0800,0010,11DD   ;2537           ALU_Q-D,CLK.UBCC                    ; CHECK
U 11DD, 0000,013C,0180,0800,0000,1046   ;2538           Z?
U 1046, 0001,203D,0180,09E8,0000,1184   ;2539   =0      ERROR2,RC[0D]_Q                     ; IE BIT FAILED
U 1047, 0003,003C,0180,09F0,0000,11DE   ;2540           RC[0E]_0
U 11DE, 0810,0038,0180,0960,0000,11DF   ;2541           D_RC[0C]
U 11DF, 0019,8000,0580,09E0,0010,11E0   ;2542           RC[0C]_D-K[.1],CLK.UBCC,BYTE        ; CHECK THE LOOP COUNT
U 11E0, 0000,013C,0180,0800,0000,1048   ;2543           Z?
U 1048, 0000,003C,0180,0800,0000,1045   ;2544   =0      J/T161L3                            ; CONTINUE
                                        ;2545
                                        ;2546
                                        ;2547   ;//////////////////////////////////////////////////////////////////////
                                        ;2548
                                        ;2549   ;+
                                        ;2550   ; NOW CHECK THE DIVIDE BY 5 COUNTER THAT GENERATES THE CLOCK PULSES TO THE
                                        ;2551   ; INTERVAL COUNTER
                                        ;2552   ;-
                                        ;2553
U 1049, 0018,0038,0580,09F0,0000,104A   ;2554   T161S5: RC[0E]_K[.1]                        ; SET THE EXPECTED DATA FOR THE RUN BIT
U 104A, 0000,003D,0180,0800,0000,1189   ;2555   =0      SUBTEST
U 104B, 0000,003C,0180,0800,0000,104C   ;2556           NOP
U 104C, 0000,003D,0980,0800,0084,7188   ;2557   =0      SETRCF[.2]
U 104D, 0F00,003C,0180,0800,0000,11E1   ;2558           D_0
U 11E1, 0000,003C,2580,3C00,0000,1050   ;2559           ID[NXT.PER]_D                       ; INIT THE NEXT INTERVAL REGISTER
U 1050, 0000,003D,0180,0800,0000,1181   ;2560   =0      ERLOOP
U 1051, 0818,0038,6580,0800,0000,11E2   ;2561           D_K[.10]
U 11E2, 0000,003C,2980,3C00,0000,11E3   ;2562           ID[CLK.CS]_D                        ; LOAD THE INTERVAL COUNTER
U 11E3, 0818,0038,0580,0800,0000,11E4   ;2563           D_K[.1]
U 11E4, 0000,003C,2980,3C00,0000,11E5   ;2564   SYNC31: ID[CLK.CS]_D                        ; START THE COUNTER
                                        ;2565
                                        ;2566   ;//////////////////////////////////////////////////////////////////////
                                        ;2567
                                        ;2568   ;+
                                        ;2569   ; MUST WAIT 8 CYCLES FOR THE COUNTER TO TICK TWICE
                                        ;2570   ;-
                                        ;2571
U 11E5, 0000,003C,29F0,2C00,0000,11E6   ;2572           Q_ID[CLK.CS]                        ; READ THE RUN BIT
```

```
U 11E6, 0000,003C,0180,0800,0000,11E7   ;2573           NOP
U 11E7, 0000,003C,0180,0800,0000,11E8   ;2574           NOP
U 11E8, 0000,003C,0180,0800,0000,11E9   ;2575   SYNC32: NOP
U 11E9, 0000,003C,0180,0800,0000,11EA   ;2576           NOP
U 11EA, 0000,003C,0180,0800,0000,11EB   ;2577           NOP
U 11EB, 0000,003C,0180,0800,0000,11EC   ;2578           NOP
U 11EC, 0F00,003C,0180,0800,0000,11ED   ;2579           D_0
                                        ;2580   ;
                                        ;2581   SYNC34:
U 11ED, 0810,0038,2980,3D70,0000,11EE   ;2582   SYNC33: ID[CLK.CS]_D,D_RC[0E]          ; STOP THE CLOCK
U 11EE, 0019,2034,05C0,0800,0000,11EF   ;2583           Q_Q.AND.K[.1]                  ; MASK THE RECEIVED RUN BIT
U 11EF, 001D,2000,0180,0800,0010,11F0   ;2584           ALU_Q-D,CLK.UBCC               ; CHECK THE RUN BIT
U 11F0, 0000,013C,0180,0800,0000,1052   ;2585           Z?
U 1052, 0001,203D,0180,09E8,0000,1184   ;2586   =0      ERROR2,RC[0D]_Q                ; RUN BIT DID NOT SET
U 1053, 0F03,003C,0180,09F0,0000,11F1   ;2587           RC[0E]_0,D_0                   ; SET EXPECTED DATA FOR RUN BIT
U 11F1, 0000,003C,29F0,2C00,0000,11F2   ;2588           Q_ID[CLK.CS]                   ; READ THE RUN BIT
U 11F2, 0019,2034,05C0,0800,0000,11F3   ;2589           Q_Q.AND.K[.1]                  ; MASK
U 11F3, 001D,2000,0180,0800,0010,11F4   ;2590           ALU_Q-D,CLK.UBCC               ; CHECK
U 11F4, 0000,013C,0180,0800,0000,1054   ;2591           Z?
U 1054, 0001,203D,0180,09E8,0000,1184   ;2592   =0      ERROR2,RC[0D]_Q                ; RUN BIT DID NOT CLEAR
U 1055, 0018,0038,0980,09F0,0000,11F5   ;2593           RC[0E]_K[.2]                   ; SET EXPECTED DATA FOR THE COUNTER
U 11F5, 0810,0038,2DF0,2D70,0000,11F6   ;2594           Q_ID[INTERVAL],D_RC[0E]        ; READ THE INTERVAL COUNTER
U 11F6, 001D,2000,0180,0800,0010,11F7   ;2595           ALU_Q-D,CLK.UBCC               ; CHECK THAT IT INCREMENTED TWICE
U 11F7, 0000,013C,0180,0800,0000,1056   ;2596           Z?
U 1056, 0001,203D,0180,09E8,0000,1184   ;2597   =0      ERROR2,RC[0D]_Q                ; INTERVAL CTR DID NOT INCREMENT
                                        ;2598
                                        ;2599
                                        ;2600   ;////////////////////////////////////////////////////////////////////////
                                        ;2601
                                        ;2602   ;+
                                        ;2603   ; NOW CHECK THE RELOAD FUNCTION AND INTERRUPT REQUEST
                                        ;2604   ;-
                                        ;2605
U 1057, 0018,0038,5580,09F0,0000,1058   ;2606   T161S6: RC[0E]_K[.3F]                  ; SET EXPECTED DATA FOR INTERVAL CTR
U 1058, 0000,003D,0180,0800,0000,1189   ;2607   =0      SUBTEST
U 1059, 0000,003C,0180,0800,0000,105C   ;2608           NOP
U 105C, 0000,003D,0180,0800,0000,1181   ;2609   =0      ERLOOP
U 105D, 0818,0038,4580,0800,0000,11F8   ;2610           D_K[.8000]                     ; GEN. NO. TO CLEAR ERROR & INT REQ
U 11F8, 0819,0030,4180,0800,0000,11F9   ;2611           D_D.OR.K[.80]                  ; ...
U 11F9, 0000,003C,29E0,3C00,0000,11FA   ;2612           ID[CLK.CS]_D,Q_D               ; CLEAR THE BITS
U 11FA, 0800,003C,0180,0A08,0000,11FB   ;2613           D_R[1]                         ; GET A MINUS ONE
U 11FB, 0C00,003C,2580,3C00,0000,11FC   ;2614           ID[NXT.PER]_D,D_Q              ; LOAD NEXT INTERVAL REG
U 11FC, 0819,0030,6580,0800,0000,11FD   ;2615           D_D.OR.K[.10]                  ; INSERT TRANSFER BIT
U 11FD, 0000,003C,2980,3C00,0000,11FE   ;2616           ID[CLK.CS]_D                   ; LOAD INTERVAL CTR REG
U 11FE, 0818,0038,5580,0800,0000,11FF   ;2617           D_K[.3F]
U 11FF, 0000,003C,2580,3C00,0000,1300   ;2618           ID[NXT.PER]_D                  ; CHANGE DATA IN NEXT INTERVAL REG
U 1300, 0818,0038,0580,0800,0000,1301   ;2619           D_K[.1]
U 1301, 0F00,003C,2980,3C00,0000,1302   ;2620   SYNC35: ID[CLK.CS]_D,D_0               ; START THE COUNTER
U 1302, 0000,003C,2980,3C00,0000,1303   ;2621           ID[CLK.CS]_D                   ; STOP THE COUNTER
U 1303, 0810,0038,2DF0,2D70,0000,1304   ;2622           Q_ID[INTERVAL],D_RC[0E]        ; READ THE INTERVAL COUNTER
U 1304, 001D,2000,0180,0800,0010,1305   ;2623           ALU_Q-D,CLK.UBCC               ; CHECK
U 1305, 0000,013C,0180,0800,0000,1060   ;2624           Z?
U 1060, 0001,203D,0180,09E8,0000,1184   ;2625   =0      ERROR2,RC[0D]_Q                ; RELOAD FAILED
U 1061, 0018,0038,4180,09F0,0000,1306   ;2626           RC[0E]_K[.80]                  ; SET EXPECTED DATA FOR INT REQ BIT
U 1306, 0810,0038,29F0,2D70,0000,1307   ;2627           Q_ID[CLK.CS],D_RC[0E]          ; READ THE INTER REQ BIT
```

```
U 1307, 001D,2000,0180,0800,0010,1308    ;2628              ALU_Q-D,CLK.UBCC                 ; CHECK
U 1308, 0000,013C,0180,0800,0000,1062    ;2629              Z?
U 1062, 0001,203D,0180,09E8,0000,1184    ;2630      =0      ERROR2,RC[0D]_Q                  ; INTERRUPT REQ BIT DID NOT SET
U 1063, 0003,003C,0180,09F0,0000,1309    ;2631              RC[0E]_0                         ; SET EXPECTED DATA FOR CLEAR OF INTER REQ
U 1309, 0818,0038,4180,0800,0000,130A    ;2632              D_K[.80]
U 130A, 0000,003C,2980,3C00,0000,130B    ;2633              ID[CLK.CS]_D                     ; CLEAR THE INTER REQ BIT
U 130B, 0F00,003C,29F0,2C00,0000,130C    ;2634              Q_ID[CLK.CS],D_0                 ; READ THE INTER REQ BIT
U 130C, 001D,2000,0180,0800,0010,130D    ;2635              ALU_Q-D,CLK.UBCC                 ; CHECK
U 130D, 0000,013C,0180,0800,0000,1064    ;2636              Z?
U 1064, 0001,203D,0180,09E8,0000,1184    ;2637      =0      ERROR2,RC[0D]_Q                  ; INTER REQ BIT DID NOT CLEAR
                                         ;2638
                                         ;2639
                                         ;2640      ;////////////////////////////////////////////////////////////////////////
                                         ;2641
                                         ;2642      ;+
                                         ;2643      ; NOW CHECK THAT THE ERROR BIT SETS AND CLEARS PROPERLY
                                         ;2644      ;-
                                         ;2645
U 1065, 081B,0000,0980,0800,0000,130E    ;2646      T161S7: D_0-K[.2]                        ; GENERATE NUMBER FOR OVERFLOW
U 130E, 0000,003C,2580,3C00,0000,1066    ;2647              ID[NXT.PER]_D                    ; LOAD NEXT INTERVAL REG
U 1066, 0000,003D,0180,0800,0000,1189    ;2648      =0      SUBTEST
U 1067, 0000,003C,0180,0800,0000,1068    ;2649              NOP
U 1068, 0000,003D,0180,0800,0000,1181    ;2650      =0      ERLOOP
U 1069, 0818,0038,4580,0800,0000,130F    ;2651              D_K[.8000]                       ; GENERATE EXPECTED DATA
U 130F, 0819,0030,4180,09F0,0000,1310    ;2652              RC[0E]_D.OR.K[.80],D_ALU         ; SAVE
U 1310, 0819,0030,6580,0800,0000,1311    ;2653              D_D.OR.K[.10]
U 1311, 0000,003C,2980,3C00,0000,1312    ;2654              ID[CLK.CS]_D                     ; LOAD THE INTERVAL CTR
U 1312, 0818,0038,0580,0800,0000,1313    ;2655              D_K[.1]
U 1313, 0000,003C,2980,3C00,0000,1314    ;2656              ID[CLK.CS]_D                     ; START THE COUNTER
                                         ;2657
                                         ;2658      ; MUST WAIT 15 CYCLES FOR ERROR TO SET
U 1314, 0000,003C,0180,0800,0000,1315    ;2659              NOP
U 1315, 0000,003C,0180,0800,0000,1316    ;2660              NOP
U 1316, 0000,003C,0180,0800,0000,1317    ;2661              NOP
U 1317, 0000,003C,0180,0800,0000,1318    ;2662              NOP
U 1318, 0000,003C,0180,0800,0000,1319    ;2663              NOP
U 1319, 0000,003C,0180,0800,0000,131A    ;2664              NOP
U 131A, 0000,003C,0180,0800,0000,131B    ;2665              NOP
U 131B, 0000,003C,0180,0800,0000,131C    ;2666              NOP
U 131C, 0000,003C,0180,0800,0000,131D    ;2667              NOP
U 131D, 0000,003C,0180,0800,0000,131E    ;2668              NOP
U 131E, 0000,003C,0180,0800,0000,131F    ;2669              NOP
U 131F, 0000,003C,0180,0800,0000,1320    ;2670              NOP
U 1320, 0000,003C,0180,0800,0000,1321    ;2671              NOP
U 1321, 0F00,003C,0180,0800,0000,1322    ;2672              D_0
                                         ;2673      ;
U 1322, 0000,003C,2980,3C00,0000,1323    ;2674      SYNC36: ID[CLK.CS]_D                     ; STOP THE CLOCK
U 1323, 0810,0038,29F0,2D70,0000,1324    ;2675              Q_ID[CLK.CS],D_RC[0E]            ; READ THE ERROR BIT
U 1324, 001D,2000,0180,0800,0010,1325    ;2676              ALU_Q-D,CLK.UBCC                 ; CHECK
U 1325, 0000,013C,0180,0800,0000,106A    ;2677              Z?
U 106A, 0001,203D,0180,09E8,0000,1184    ;2678      =0      ERROR2,RC[0D]_Q                  ; ERROR BIT DID NOT SET
U 106B, 0810,0038,0180,0970,0000,1326    ;2679              D_RC[0E]
U 1326, 0000,003C,2980,3C00,0000,1327    ;2680      SYNC37: ID[CLK.CS]_D                     ; CLEAR THE ERROR BIT
U 1327, 0F00,003C,29F0,2C00,0000,1328    ;2681              Q_ID[CLK.CS],D_0                 ; READ IT BACK
U 1328, 001D,2000,0180,0800,0010,1329    ;2682              ALU_Q-D,CLK.UBCC                 ; CHECK
```

```
U 1329, 0003,013C,0180,09F0,0000,106C    ;2683              Z?,RC[0E]_0
U 106C, 0001,203D,0180,09E8,0000,1184    ;2684    =0        ERROR2,RC[0D]_Q                 ; ERROR BIT DID NOT CLEAR
U 106D, 0000,003C,0180,0800,0000,106E    ;2685              NOP
                                         ;2686
                                         ;2687
                                         ;2688
                                         .PAGE   "TEST 162        IPL ACTIVE BITS IN THE SIR REGISTER & IPL_IPL ACTIVE IN PSL"
                                         ;**********************************************************************
                                         ;++
                                         ; TEST  162     IPL ACTIVE BITS IN THE SIR REGISTER & IPL_IPL ACTIVE IN PSL
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS TEST CHECKS THE DATA INTEGRITY OF THE IPL ACTIVE BITS (<20:16>)
                                         ;       IN THE SIR REGISTER AND THE VECTOR BITS IN THE VECTOR REGISTER.
                                         ;
                                         ;       SUBTST 1 - FILL BITS <15:0> OF THE SIR WITH ONE'S AND CHECK THAT
                                         ;                  THE IPL ACTIVE GOES FROM 0 TO F AND THAT THE VECTOR
                                         ;                  GOES FROM 0 TO 84 TO 88 TO 8C, ETC AND THAT THE IPL LEVEL
                                         ;                  GETS LOADED FROM THE IPL ACTIVE LEVEL ON AN INTERRUPT ACK.
                                         ;       SUBTST 2 - SET THE INTERRUPT ENABLE BIT IN THE TRANSMITTER CONTROL
                                         ;                  AND STATUS REGISTER AND CHECK THAT THE IPL ACTIVE LEVEL
                                         ;                  GOES TO 14. THEN CLEAR THE INTERRUPT ENABLE BIT AND
                                         ;                  THE HARDWARE INTERRUPT REQUEST AND CHECK THAT THE
                                         ;                  IPL ACTIVE LEVEL CLEARED. ALSO CHECKS THAT THE VECTOR
                                         ;                  COMES UP FC WHEN IPL 14 IS ACTIVE.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;       THIS TEST CHECKS THE SIR PRIORITY ENCODERS, PART OF THE HIR PRIORITY
                                         ;       ENCODERS, AND THE IPL ACTIVE MULTIPLEXOR, AND THE ID BUS INTERFACE
                                         ;       TO THE IPL ACTIVE BITS, ON THE ICL MODULE. IT ALSO CHECKS PART
                                         ;       OF THE VECTOR ROM AND THE VECTOR BITS IN THE VECTOR REGISTER.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       DATA: EXPECTED IPL ACTIVE BITS OR IPL BITS OR VECTOR BITS
                                         ;             RECEIVED IPL ACTIVE BITS OR IPL BITS OR VECTOR BITS
                                         ;             LOOP COUNT - SUBTST 1 ONLY  --  INDICATES WHICH BIT OF THE
                                         ;               SIR REGISTER IS THE HIGHEST PRIORITY, I.E.
                                         ;                  10= BIT 0, F= BIT 1, E= BIT 2, ETC.
                                         ;             ERROR TYPE FLAG - 0=IPL ACTIVE BITS FAILED, 1=IPL LEVEL FAILED,
                                         ;                               AND 2 = VECTOR FAILED
                                         ;
                                         ; SYNC POINT DESCRIPTION
                                         ;       SUBTST 1 - SYNC06--LOAD THE SIR REGISTER WITH THE TEST PATTERN
                                         ;                  SYNC07--READ THE IPL ACTIVE BITS
                                         ;                  SYNC1D--LOAD THE IPL WITH AN INTERRUPT ACK
                                         ;                  SYNC0C--READ THE VECTOR BITS
                                         ;       SUBTST 2 - SYNC08--LATCH HIR LEVEL 14
                                         ;                  SYNC09--READ THE IPL ACTIVE BITS
                                         ;                  SYNC0D--READ THE VECTOR BITS
                                         ;                  SYNC0A--CLEAR HIR LEVEL 14
                                         ;                  SYNC0B--READ THE IPL ACTIVE BITS
                                         ;
                                         ;--
                                         ;**********************************************************************
                                         =0
U 106E, 0018,0039,1180,09F8,0000,116D    T162:   NEWTST[.4]
U 106F, 0018,0038,0580,0A80,0000,1070            R[0]_K[.1]                  ; INIT THE SIR DATA
U 1070, 0000,003D,0180,0800,0000,11A4    =0      CALL,J/UNJAM                ; CLEAR ANY SBI INTERRUPTS
U 1071, 0003,003C,0180,09F0,0000,132A            RC[0E]_0                    ; INIT THE EXPECTED DATA
U 132A, 0003,003C,0180,0A[illegible],0000,132B            R[3]_0                      ; SET SAVE LOCATION FOR EXP DATA
U 132B, 0818,0038,4580,0800,0000,132C            D_K[.8000]                  ; GEN INCREMENT FOR EXPECTED DATA
U 132C, 0500,003C,6580,0800,0084,732D            D_D.LEFT,SC_K[.10]
```

```
U 132D, 0001,003C,01F8,0A88,0000,132E   ;2744            R[1]_D,Q_0                      ; SAVE IN R1
U 132E, 0818,0038,8D80,0800,0000,132F   ;2745            D_K[.1F]                        ; GENERATE MASK FOR IPL ACTIVE BITS
U 132F, 0D00,003C,0180,0800,0000,1330   ;2746            D_DAL.SC                        ; ...
U 1330, 0001,003C,0180,0A90,0000,1331   ;2747            R[2]_D                          ; SAVE
                                        ;2748
                                        ;2749   ;//////////////////////////////////////////////////////////////////////
                                        ;2750   ;+
                                        ;2751   ; CHECK IPL ACTIVE LEVELS 0 THRU F
                                        ;2752   ;-
                                        ;2753
U 1331, 0018,0038,6580,09E0,0000,1072   ;2754   T162S1: RC[0C]_K[.10]                   ; SET THE LOOP COUNT
U 1072, 0003,003D,0180,0AA0,0000,1189   ;2755   =0      SUBTEST,R[4]_0                  ; SET INITIAL VECTOR
U 1073, 0800,003C,0180,0A00,0000,1332   ;2756   T162L1: D_R[0]                          ; GET SIR DATA
U 1332, 0003,003C,0180,09D8,0000,1333   ;2757           RC[0B]_0                        ; SET ERROR TYPE FLAG
U 1333, 0000,003C,3980,3C00,0000,1074   ;2758   SYNC06: ID[SIR]_D                       ; LOAD THE SIR
U 1074, 0000,003D,0180,0800,0000,1181   ;2759   =0      ERLOOP
U 1075, 0810,0038,39F0,2D70,0000,1334   ;2760   SYNC07: Q_ID[SIR],D_RC[0E]              ; GET THE IPL ACTIVE BITS
U 1334, 001C,0034,01C0,0A10,0000,1335   ;2761           Q_Q.AND.R[2]                    ; MASK
U 1335, 001D,2000,0180,0800,0010,1336   ;2762           A[U_Q-D,CLK.UBCC                ; CHECK
U 1336, 0000,013C,0180,0800,0000,1076   ;2763           Z?
U 1076, 0001,203D,0180,09E8,0000,1184   ;2764   =0      ERROR2,RC[0D]_Q                 ; IPL ACTIVE BITS FAILED
                                        ;2765
                                        ;2766   ;+
                                        ;2767   ; NOW CHECK THAT IPL GETS LOADED FROM THE IPL ACTIVE ON AN INTERRUPT ACK.
                                        ;2768   ;-
                                        ;2769
U 1077, 0018,0038,0580,09D8,0000,1078   ;2770           RC[0B]_K[.1]                    ; SET ERROR TYPE FLAG
U 1078, 0000,003D,0180,0800,0000,1181   ;2771   =0      ERLOOP
U 1079, 0810,0038,0180,0970,8000,1337   ;2772   SYNC1D: INTRPT.ACK,D_RC[0E]             ; EXECUTE THE INTERRUPT ACK
U 1337, 0000,003C,3DF0,2C00,0000,1338   ;2773           Q_ID[PSL]                       ; READ THE IPL LEVEL
U 1338, 001C,0034,01C0,0A10,0000,1339   ;2774           Q_Q.AND.R[2]                    ; MASK
U 1339, 001D,2000,0180,0800,0010,133A   ;2775           A[U_Q-D,CLK.UBCC                ; CHECK
U 133A, 0000,013C,0180,0800,0000,107A   ;2776           Z?                              ; BRANCH IF OK
U 107A, 0001,203D,0180,09E8,0000,1184   ;2777   =0      ERROR2,RC[0D]_Q                 ; IPL DID NOT SET FROM IPL ACTIVE
                                        ;2778
                                        ;2779   ;+
                                        ;2780   ; NOW CHECK THE VECTOR ASSOCIATED WITH THIS IPL ACTIVE LEVEL
                                        ;2781   ;-
                                        ;2782
U 107B, 0000,003C,0180,0A20,0000,133B   ;2783           LAB_R[4]                        ; LATCH EXPECTED VECTOR
U 133B, 0000,003C,0180,09F0,0000,133C   ;2784           RC[0E]_LA                       ; SAVE
U 133C, 0018,0038,0980,09D8,0000,107C   ;2785           RC[0B]_K[.2]                    ; SET ERROR TYPE FLAG
U 107C, 0000,003D,0180,0800,0000,1181   ;2786   =0      ERLOOP
U 107D, 0810,0038,0180,0970,0000,133D   ;2787           D_RC[0E]
U 133D, 0000,003C,35F0,2C00,0000,133E   ;2788   SYNC0C: Q_ID[VECTOR]                    ; READ THE VECTOR BITS
U 133E, 0019,2034,81C0,0800,0000,133F   ;2789           Q_Q.AND.K[.3FF]                 ; MASK
U 133F, 001D,2000,0180,0800,0010,1340   ;2790           A[U_Q-D,CLK.UBCC                ; CHECK
U 1340, 0000,013C,0180,0800,0000,107E   ;2791           Z?
U 107E, 0001,203D,0180,09E8,0000,1184   ;2792   =0      ERROR2,RC[0D]_Q                 ; VECTOR IS INCORRECT
                                        ;2793
                                        ;2794   ;+
                                        ;2795   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;2796   ;-
                                        ;2797
U 107F, 0800,003C,0180,0A18,0000,1341   ;2798           D_R[3]                          ; GET THE EXP DATA FOR IPL ACTIVE
```

```
U 1341, 0000,003C,0180,0A08,0000,1342   ;2799           LAB_R[1]
U 1342, 001C,2014,0180,0A98,0000,1343   ;2800           R[3]_LA+D                       ; INCREMENT EXPECTED VALUE OF IPL ACTIVE
U 1343, 001C,2014,0180,09F0,0000,1344   ;2801           RC[OE]_LA+D
U 1344, 0800,803C,0180,0A20,0010,1345   ;2802           D_R[4],CLK.UBCC,BYTE            ; GET EXPECTED VECTOR
U 1345, 0000,013C,0180,0800,0000,1080   ;2803           Z?                              ; BRANCH IF ITS ZERO
U 1080, 0000,003C,0180,0800,0000,1346   ;2804   =0      J/T2P1                          ; NON ZERO, SO JUST INCREMENT IT
U 1081, 0818,0038,4180,0800,0000,1346   ;2805           D_K[.80]                        ; SET VECTOR FOR IPL ACTIVE 1
U 1346, 0019,0014,1180,0AA0,0000,1347   ;2806   T2P1:   R[4]_D+K[.4]                    ; INCREMENT CURRENT EXPECTED VECTOR
U 1347, 0000,003C,01C0,0A00,0000,1348   ;2807           Q_R[0]                          ; GET SIR DATA
U 1348, 0000,003C,03A8,0800,0000,1349   ;2808           Q_Q.LEFT,SI/MUL-                ; GENERATE NEXT PATTERN
U 1349, 0001,203C,0180,0A80,0000,134A   ;2809           R[0]_Q                          ; SAVE
U 134A, 0810,0038,0180,0960,0000,134B   ;2810           D_RC[OC]
U 134B, 0019,8000,0580,09E0,0010,134C   ;2811           RC[OC]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT LOOP COUNT
U 134C, 0000,013C,0180,0800,0000,1082   ;2812           Z?
U 1082, 0000,003C,0180,0800,0000,1073   ;2813   =0      J/T162L1                        ; CONTINUE
                                        ;2814
                                        ;2815
                                        ;2816   ;//////////////////////////////////////////////////////////////////////
                                        ;2817   ;+
                                        ;2818   ; NOW CHECK HIR 14 (ALSO IPL ACTIVE 14) BY SETTING THE INTERRUPT
                                        ;2819   ; ENABLE BIT IN THE TXCS REGISTER
                                        ;2820   ;-
                                        ;2821
U 1083, 0F00,003C,6580,0800,0084,734D   ;2822   T162S2: D_0,SC_K[.10]
U 134D, 0000,003C,3980,3C00,0000,1084   ;2823           ID[SIR]_D                       ; ENSURE SIR IS CLEAR
U 1084, 0000,003D,0180,0800,0000,1189   ;2824   =0      SUBTEST
U 1085, 0818,0038,21F8,0800,0000,134E   ;2825           D_K[.14],Q_0                    ; GENERATE THE EXPECTED DATA
U 134E, 0D00,003C,0180,0800,0000,134F   ;2826           D_DAL.SC
U 134F, 0001,003C,0180,09F0,0000,1350   ;2827           RC[OE]_D                        ; SAVE
U 1350, 0003,003C,0180,09D8,0000,1086   ;2828           RC[OB]_0                        ; SET ERROR TYPE FLAG
U 1086, 0000,003D,0180,0800,0000,1181   ;2829   =0      ERLOOP
U 1087, 0F00,003C,0180,0800,0000,1351   ;2830           D_0
U 1351, 0000,003C,1980,3C00,0000,1352   ;2831           ID[TXCS]_D                      ; ENSURE INTERRUPT ENABLE CLEAR
U 1352, 0818,0038,3180,0800,0000,1353   ;2832           D_K[.40]
U 1353, 0000,003C,1980,3C00,0000,1354   ;2833           ID[TXCS]_D                      ; SET THE INTERRUPT ENABLE BIT
U 1354, 0000,003C,0180,0800,0000,1355   ;2834           NOP                             ; ALLOW SYNC CXMT INTR TO SET
U 1355, 0000,003C,0180,0800,4000,1356   ;2835   SYNC08: INTRPT.STROBE                   ; LATCH THE CONSOLE INTERRUPT
U 1356, 0810,0038,39F0,2D70,0000,1357   ;2836   SYNC09: Q_ID[SIR],D_RC[OE]              ; READ THE IPL ACTIVE BITS
U 1357, 001C,0034,01C0,0A10,0000,1358   ;2837           Q_Q.AND.R[2]                    ; MASK
U 1358, 001D,2000,0180,0800,0010,1359   ;2838           ALU_Q-D,CLK.UBCC                ; CHECK
U 1359, 0000,013C,0180,0800,0000,1088   ;2839           Z?
U 1088, 0001,203D,0180,09E8,0000,1184   ;2840   =0      ERROR2,RC[OD]_Q                 ; IPL ACTIVE INCORRECT
                                        ;2841
                                        ;2842   ;+
                                        ;2843   ; NOW CHECK THE VECTOR FOR IPL ACTIVE 14
                                        ;2844   ;-
                                        ;2845
U 1089, 0018,0038,0980,09D8,0000,108A   ;2846           RC[OB]_K[.2]                    ; SET THE ERROR TYPE FLAG
U 108A, 0818,0039,6180,0800,0000,1186   ;2847   =0      D_K[.F],CALL,J/DCC              ; GENERATE THE VECTOR
U 108B, 0001,003C,0180,09F0,0000,108C   ;2848           RC[OE]_D                        ; SAVE
U 108C, 0000,003D,0180,0800,0000,1181   ;2849   =0      ERLOOP
U 108D, 0000,003C,35F0,2C00,0000,135A   ;2850           Q_ID[VECTOR]                    ; READ THE VECTOR REG
U 135A, 0019,2034,81C0,0800,0000,135B   ;2851           Q_Q.AND.K[.3FF]                 ; MASK
U 135B, 0810,0038,0180,0970,0000,135C   ;2852           D_RC[OE]
U 135C, 001D,2000,0180,0800,0010,135D   ;2853           ALU_Q-D,CLK.UBCC                ; CHECK
```

```
U 135D, 0000,013C,0180,0800,0000,108E                    Z?
U 108E, 0001,203D,0180,09E8,0000,1184           =0       ERROR2,RC[0D]_Q               ; VECTOR INCORRECT
U 108F, 0000,003C,6580,0800,0084,735E                    SC_K[.10]
U 135E, 0818,0038,21F8,0800,0000,135F                    D_K[.14],Q_0                  ; GENERATE EXPECTED DATA
U 135F, 0D00,003C,0180,0800,0000,1360                    D_DAL.SC                      ; ...
U 1360, 0001,003C,0180,09F0,0000,1090                    RC[0E]_D                      ; SAVE
U 1090, 0000,003D,0180,0800,0000,1181           =0       ERLOOP
U 1091, 0018,0038,0580,09D8,0000,1361                    RC[0B]_K[.1]                  ; SET ERROR TYPE FLAG
U 1361, 0F00,003C,0180,0800,0000,1362                    D_0
U 1362, 0000,003C,1980,3C00,0000,1363                    ID[TXCS]_D                    ; CLEAR IE BIT
U 1363, 0810,0038,0180,0970,8000,1364                    INTRPT.ACK,D_RC[0E]           ; LOAD THE IPL LEVEL
U 1364, 0000,003C,3DF0,2C00,0000,1365                    Q_ID[PSL]                     ; GET IPL LEVEL
U 1365, 001C,0034,01C0,0A10,0000,1366                    Q_Q.AND.R[2]                  ; MASK
U 1366, 001D,2000,0180,0800,0010,1367                    A[U_Q-D,CLK.UBCC              ; IPL OK?
U 1367, 0000,013C,0180,0800,0000,1092                    Z?
U 1092, 0001,203D,0180,09E8,0000,1184           =0       ERROR2,RC[0D]_Q               ; IPL LEVEL INCORRECT
U 1093, 0003,003C,0180,09F0,0000,1368                    RC[0E]_0                      ; SET THE EXPECTED DATA
U 1368, 0003,003C,0180,09D8,0000,1369                    RC[0B]_0                      ; SET THE ERROR TYPE FLAG
U 1369, 0000,003C,0180,0800,4000,136A           SYNC0A:  INTRPT.STROBE                 ; CLEAR HIR 14
U 136A, 0F00,003C,39F0,2C00,0000,136B           SYNC0B:  Q_ID[SIR],D_0                 ; READ THE IPL ACTIVE BITS
U 136B, 001C,0034,01C0,0A10,0000,136C                    Q_Q.AND.R[2]                  ; MASK
U 136C, 001D,2000,0180,0800,0010,136D                    A[U_Q-D,CLK.UBCC              ; CHECK
U 136D, 0000,013C,0180,0800,0000,1094                    Z?
U 1094, 0001,203D,0180,09E8,0000,1184           =0       ERROR2,RC[0D]_Q               ; IPL 14 DID NOT CLEAR
U 1095, 0000,003C,0180,0800,0000,1096                    NOP
```

```
                                          ;2882   .PAGE   "TEST 163       BRANCH ENABLE E -- INTERRUPT"
                                          ;2883   ;*********************************************************************
                                          ;2884   ;++
                                          ;2885   ; TEST  163     BRANCH ENABLE E --- INTERRUPT
                                          ;2886   ;
                                          ;2887   ; TEST DESCRIPTION
                                          ;2888   ;       THIS TEST CHECKS THE INTERRUPT PENDING BRANCH.
                                          ;2889   ;
                                          ;2890   ;       SUBTST 1 - CHECK THAT BRANCH BIT 1 IS ASSERTED AND THAT BRANCH
                                          ;2891   ;                  BIT 0 AND 2 ARE DEASSERTED.
                                          ;2892   ;       SUBTST 2 - SET A SOFTWARE INTERRUPT REQUEST AND CHECK THAT BRANCH
                                          ;2893   ;                  BITS 0 AND 1 ASSERT, AND BRANCH BIT 2 IS DEASSERTED.
                                          ;2894   ;
                                          ;2895   ; LOGIC DESCRIPTION
                                          ;2896   ;       THIS TEST CHECKS THE BRANCH MULTIPLEXORS ON THE ICL MODULE.
                                          ;2897   ;
                                          ;2898   ; ERROR DESCRIPTION
                                          ;2899   ;       DATA: EXPECTED BRANCH BITS <2:0>
                                          ;2900   ;             RECEIVED BRANCH BITS <2:0>
                                          ;2901   ;
                                          ;2902   ; SYNC POINT DESCRIPTION
                                          ;2903   ;       ADDRESS SYNC1F--BRANCH E IS ENABLED
                                          ;2904   ;--
                                          ;2905   ;*********************************************************************
                                          ;2906   =0
U 1096, 0018,0039,0980,09F8,0000,116D     ;2907   T163:   NEWTST[.2]
U 1097, 0F18,0038,0980,09F0,0000,136E     ;2908           RC[OE]_K[.2],D_0                ; INIT EXPECTED BRANCH BITS
U 136E, 0000,003C,3980,3C00,0000,1098     ;2909           ID[SIR]_D                       ; ENSURE THE SIR IS CLEAR
                                          ;2910
                                          ;2911   ;///////////////////////////////////////;/////////////////////////
                                          ;2912   ;+
                                          ;2913   ; CHECK BRANCH BITS <2:0>=010
                                          ;2914   ;-
                                          ;2915
                                          ;2916   =0
U 1098, 0000,003D,3D80,3C00,0000,1189     ;2917   T163S1: SUBTEST,ID[PSL]_D               ; ENSURE THE PSL IS CLEAR
U 1099, 0000,003C,0180,0800,0000,109A     ;2918           NOP
U 109A, 0000,003D,0180,0800,0000,1181     ;2919   =0      ERLOOP
U 109B, 0810,0038,0180,0970,0000,109C     ;2920           D_RC[OE]                        ; GET EXPECTED BRANCH BITS
U 109C, 0000,003D,0180,0800,0000,1372     ;2921   =0      CALL,J/TSTBRE                   ; GO EXECUTE THE BRANCH
U 109D, 001D,A000,0180,0800,0010,136F     ;2922           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK RESULT OF BRANCH
U 136F, 0000,013C,0180,0800,0000,109E     ;2923           Z?
U 109E, 0001,203D,0180,09E8,0000,1184     ;2924   =0      ERROR2,RC[OD]_Q                 ; BRANCH ENABLE E FAILED
                                          ;2925
                                          ;2926   ;/////////////////////////////////////////////////////////////////
                                          ;2927   ;+
                                          ;2928   ; CHECK THAT BRANCH BIT 0 ASSERTS
                                          ;2929   ;-
                                          ;2930
U 109F, 0018,0038,0D80,09F0,0000,10A0     ;2931   T163S2: RC[OE]_K[.3]                    ; SET THE EXPECTED BRANCH BITS
U 10A0, 0818,0039,0980,0800,0000,1189     ;2932   =0      SUBTEST,D_K[.2]
U 10A1, 0000,003C,3980,3C00,0000,10A2     ;2933           ID[SIR]_D                       ; SET AN INTERRUPT AT LEVEL 1
U 10A2, 0000,003D,0180,0800,0000,1181     ;2934   =0      ERLOOP
U 10A3, 0810,0038,0180,0970,0000,10A4     ;2935           D_RC[OE]
U 10A4, 0000,003D,0180,0800,0000,1372     ;2936   =0      CALL,J/TSTBRE                   ; GO EXECUTE THE BRANCH
```

```
U 10A5, 001D,A000,0180,0800,0010,1370   ;2937           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE BRANCH BITS
U 1370, 0000,013C,0180,0800,0000,10A6   ;2938           Z?
U 10A6, 0001,203D,0180,09E8,0000,1184   ;2939   =0      ERROR2,RC[0D]_Q                 ; BRANCH E FAILED
U 10A7, 0F00,003C,0180,0800,0000,1371   ;2940           D_0
U 1371, 0000,003C,3980,3C00,0000,1374   ;2941           ID[SIR]_D,J/T163END             ; CLEAR THE INTERRUPT
                                        ;2942
                                        ;2943   ;+
                                        ;2944   ; THIS TABLE ENABLES THE BRANCH E. IT EXITS WITH A NUMBER
                                        ;2945   ; IN THE Q REGISTER CORRESPONDING TO THE BRANCH BITS THAT ASSERTED.
                                        ;2946   ;-
                                        ;2947
                                        ;2948   SYNC1F:
U 1372, 0000,0E3C,0180,0800,0000,1010   ;2949   TSTBRE: AC.LOW?                         ; EXECUTE THE BRANCH
U 1010, 0000,003E,01F8,0800,0000,0001   ;2950   =000    Q_0,RETURN1
U 1011, 0018,003A,05C0,0800,0000,0001   ;2951           Q_K[.1],RETURN1
U 1012, 0018,003A,09C0,0800,0000,0001   ;2952           Q_K[.2],RETURN1
U 1013, 0018,003A,0DC0,0800,0000,0001   ;2953           Q_K[.3],RETURN1
U 1014, 0018,003A,11C0,0800,0000,0001   ;2954           Q_K[.4],RETURN1
U 1015, 0018,0038,11C0,0800,0000,1373   ;2955           Q_K[.4],J/INCQ
U 1016, 0018,003A,D5C0,0800,0000,0001   ;2956           Q_K[.6],RETURN1
U 1017, 0018,003A,5DC0,0800,0000,0001   ;2957           Q_K[.7],RETURN1
U 1373, 0019,2016,05C0,0800,0000,0001   ;2958   INCQ:   Q_Q+K[.1],RETURN1
                                        ;2959
                                        ;2960
                                        ;2961
                                        ;2962
U 1374, 0000,003C,0180,0800,0000,10A8   ;2963   T163END:NOP
                                        ;2964
```

```
.PAGE   "TEST 164       INTERRUPT REQUEST COMPARATOR"
;*******************************************************************************
;++
; TEST  164     INTERRUPT REQUEST COMPARATOR
;
; TEST DESCRIPTION
;       THIS TEST CHECKS THE INTERRUPT REQUEST COMPARATOR BY RUNNING A
;       COUNT PATTERN THRU THE IPL FOR EACH OF THE FIRST 16 LEVELS OF
;       IPL ACTIVE AND USES THE INTERRUPT BRANCH TO DETECT WHETHER
;       THE INTERRUPT REQUEST SIGNAL IS ACTIVE.
;
;       SUBTST 1 - RUN A COUNT PATTERN THRU THE IPL FOR EACH OF 16 LEVELS
;                  OF IPL ACTIVE.
;                  FOLLOWING IS A TABLE THAT SHOWS THE EXPECTED BRANCH
;                  CONDITION FOR EACH VALUE OF THE IPL AND IPL ACTIVE BITS:
;
;       IPL ACTIVE                IPL                BRANCH BIT 0
;       ----------                ---                ------------
;
;          0                      0-F                        FALSE
;          1                      0                          TRUE
;                                 1-F                        FALSE
;          2                      0-1                        TRUE
;                                 2-F                        FALSE
;          3                      0-2                        TRUE
;                                 3-F                        FALSE
;          4                      0-3                        TRUE
;                                 4-F                        FALSE
;          5                      0-4                        TRUE
;                                 5-F                        FALSE
;          6                      0-5                        TRUE
;                                 6-F                        FALSE
;          7                      0-6                        TRUE
;                                 7-F                        FALSE
;          8                      0-7                        TRUE
;                                 8-F                        FALSE
;          9                      0-8                        TRUE
;                                 9-F                        FALSE
;          A                      0-9                        TRUE
;                                 A-F                        FALSE
;          B                      0-A                        TRUE
;                                 B-F                        FALSE
;          C                      0-B                        TRUE
;                                 C-F                        FALSE
;          D                      0-C                        TRUE
;                                 D-F                        FALSE
;          E                      0-D                        TRUE
;                                 E-F                        FALSE
;          F                      0-E                        TRUE
;                                 F                          FALSE
;       SUBTST 2 - ASSERT IPL ACTIVE 14 AND CHECK THAT AN IPL LEVEL OF LESS
;                  THAN 10 ENABLES "INTERRUPT REQUEST".
;       SUBTST 3 - ASSERT IPL ACTIVE 14 AND CHECK THAT AN IPL LEVEL OF LESS
;                  THAN 14 BUT GREATER THAN F ENABLES "INTERRUPT REQUEST".
;       SUBTST 4 - ASSERT IPL ACTIVE 14 AND CHECK THAT AN IPL LEVEL GREATER
```

```
                                              ;3020   ;                      THAN OR EQUAL TO 14 DOES NOT ASSERT "INTERRUPT REQUEST".
                                              ;3021   ;
                                              ;3022   ; LOGIC DESCRIPTION
                                              ;3023   ;       THIS TEST CHECKS THE LOGIC ON THE CEH MODULE THAT GENERATES THE
                                              ;3024   ;       SIGNAL "INTR REQ".
                                              ;3025   ;
                                              ;3026   ; ERROR DESCRIPTION
                                              ;3027   ;       DATA: EXPECTED BRANCH BIT 0
                                              ;3028   ;             RECEIVED BRANCH BIT 0
                                              ;3029   ;             LOOP COUNT FOR THE IPL LEVEL - SUBTST 1 ONLY -- INDICATES
                                              ;3030   ;               WHICH IPL LEVEL IS CURRENTLY SET, I.E. 10=0, F=1, ETC.
                                              ;3031   ;             LOOP COUNT FOR THE IPL ACTIVE LEVEL - SUBTST 1 ONLY -- INDICATES
                                              ;3032   ;               WHICH IPL ACTIVE LEVEL IS CURRENTLY SET, I.E. 10=0, F=1, ETC.
                                              ;3033   ;
                                              ;3034   ; SYNC POINT DESCRIPTION
                                              ;3035   ;       SUBTST 1 - SYNC0E--INTERRUPT REQ SHOULD BE STABLE
                                              ;3036   ;       SUBTST 2 - SYNC0F--INTERRUPT REQ SHOULD BE STABLE
                                              ;3037   ;       SUBTST 3 - SYNC10--INTERRUPT REQ SHOULD BE STABLE
                                              ;3038   ;       SUBTST 4 - SYNC11--INTERRUPT REQ SHOULD BE STABLE
                                              ;3039   ;--
                                              ;3040   ;*********************************************************************
                                              ;3041   =0
U 10A8, 0018,0039,1180,09F8,0000,116D         ;3042   T164:   NEWTST[.4]
U 10A9, 0818,0038,0580,0A80,0000,1375         ;3043           R[0]_K[.1],D_K[.1]                  ; INITIALIZE THE SIR DATA
U 1375, 0000,003C,65F8,0800,0084,7376         ;3044           SC_K[.10],Q_0                       ; SETUP FOR D SHIFT OF 16
U 1376, 0D00,003C,0180,0800,0000,10AA         ;3045           D_DAL.SC                            ; GENERATE INCREMENT FOR IPL LEVEL
U 10AA, 0001,003D,0180,0A88,0000,11A4         ;3046   =0      R[1]_D,CALL[UNJAM]                  ; CLEAR ANY SBI INTERRUPTS
U 10AB, 0003,003C,0180,0A90,0000,1377         ;3047           R[2]_0                              ; INITIALIZE THE IPL ACTIVE LEVEL
U 1377, 0003,003C,0180,0A98,0000,1378         ;3048           R[3]_0                              ; INITIALIZE THE IPL LEVEL
U 1378, 0F03,003C,0180,09F0,0000,1379         ;3049           RC[0E]_0,D_0                        ; INITIALIZE EXPECTED BRANCH BIT
U 1379, 0000,003C,3D80,3C00,0000,137A         ;3050           ID[PSL]_D                           ; INIT THE IPL LEVEL
U 137A, 0000,003C,3180,3C00,0000,137B         ;3051           ID[CES]_D                           ; ENSURE TRAP CODES CLEAR
                                              ;3052
                                              ;3053   ;/////////////////////////////////////////////////////////////////
                                              ;3054   ;+
                                              ;3055   ; CHECK THE INTERRUPT REQUEST COMPARATOR
                                              ;3056   ;-
                                              ;3057
U 137B, 0018,0038,6580,09D8,0000,10AC         ;3058   T164S1: RC[0B]_K[.10]                       ; SET LOOP COUNT OF IPL ACTIVE
U 10AC, 0018,0039,6580,09E0,0000,1189         ;3059   =0      SUBTEST,RC[0C]_K[.10]               ; SET LOOP COUNT OF IPL LEVEL
U 10AD, 0800,003C,0180,0A00,0000,137C         ;3060   T164L1: D_R[0]                              ; GET SIR DATA TO SET IPL ACTIVE
U 137C, 0000,003C,3980,3C00,0000,137D         ;3061           ID[SIR]_D                           ; SET THE SIR
U 137D, 0800,003C,0180,0A18,0000,137E         ;3062           D_R[3]                              ; GET THE IPL LEVEL
U 137E, 0000,003C,3D80,3C00,0000,10AE         ;3063           ID[PSL]_D                           ; SET THE IPL LEVEL
U 10AE, 0000,003D,0180,0800,0000,1181         ;3064   =0      ERLOOP
U 10AF, 0810,0E38,0180,0970,0000,101E         ;3065   SYNC0E: D_RC[0E],AC.LOW?                    ; EXECUTE THE BRANCH
U 101E, 0000,003C,01F8,0800,0000,137F         ;3066   =110    Q_0,J/X                             ; BRANCH BIT DID NOT ASSERT
U 101F, 0018,0038,05C0,0800,0000,137F         ;3067           Q_K[.1]                             ; BRANCH BIT ASSERTED
U 137F, 001D,A000,0180,0800,0010,1380         ;3068   X:      A[U_Q-D,CLK.UBCC,BYTE               ; CHECK HTE ADDRESS
U 1380, 0000,013C,0180,0800,0000,10B0         ;3069           Z?
U 10B0, 0001,203D,0180,09E8,0000,1184         ;3070   =0      ERROR2,RC[0D]_Q                     ; INTERRUPT REQ FAILED
                                              ;3071
                                              ;3072   ;+
                                              ;3073   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                              ;3074   ;-
```

```
                                          ;3075
U 10B1, 0800,003C,0180,0A18,0000,1381     ;3076            D_R[3]                              ; GET CURRENT IPL LEVEL
U 1381, 0000,003C,0180,0A08,0000,1382     ;3077            LAB_R[1]                            ; LATCH THE INCREMENT VALUE
U 1382, 001C,2014,0180,0A98,0000,1383     ;3078            R[3]_LA+D                           ; INCREMENT THE IPL LEVEL
U 1383, 0810,0038,0180,0960,0000,1384     ;3079            D_RC[0C]
U 1384, 0019,8000,0580,09E0,0010,1385     ;3080            RC[0C]_D-K[.1],CLK.UBCC,BYTE        ; DECREMENT IPL LOOP COUNT
U 1385, 0000,013C,0180,0800,0000,10B2     ;3081            Z?
U 10B2, 0000,003C,0180,0800,0000,1390     ;3082    =0      J/T164P1                            ; GO CHECK EXPECTED BRANCH BIT
U 10B3, 0003,003C,0180,0A98,0000,1386     ;3083            R[3]_0                              ; SET IPL LEVEL TO ZERO
U 1386, 0800,003C,0180,0A10,0000,1387     ;3084            D_R[2]                              ; GET CURRENT ACTIVE IPL LEVEL
U 1387, 0000,003C,0180,0A08,0000,1388     ;3085            LAB_R[1]                            ; LATCH INCREMENT VALUE
U 1388, 001C,2014,0180,0A90,0000,1389     ;3086            R[2]_LA+D                           ; INCREMENT ACTIVE IPL LEVEL
U 1389, 0800,003C,0180,0A00,0000,138A     ;3087            D_R[0]                              ; GET SIR DATA
U 138A, 0500,003C,0180,0800,0000,138B     ;3088            D_D.LEFT                            ; GENERATE NEXT SIR LEVEL
U 138B, 0001,003C,0180,0A80,0000,138C     ;3089            R[0]_D                              ; SAVE
U 138C, 0018,0038,6580,09E0,0000,138D     ;3090            RC[0C]_K[.10]                       ; INIT IPL LOOP COUNT
U 138D, 0810,0038,0180,0958,0000,138E     ;3091            D_RC[0B]
U 138E, 0019,8000,0580,09D8,0010,138F     ;3092            RC[0B]_D-K[.1],CLK.UBCC,BYTE        ; DECREMENT ACTIVE IPL LOOP COUNT
U 138F, 0000,013C,0180,0800,0000,10B4     ;3093            Z?
U 10B4, 0000,003C,0180,0800,0000,1390     ;3094    =0      J/T164P1                            ; GO CHECK EXPECTED BRANCH BIT
U 10B5, 0000,003C,0180,0800,0000,1394     ;3095            J/T164S2                            ; GO TO NEXT TEST
                                          ;3096
                                          ;3097    ;+
                                          ;3098    ; CALCULATE THE EXPECTED IB ADDRESS
                                          ;3099    ;-
                                          ;3100
U 1390, 0800,003C,0180,0A10,0000,1391     ;3101    T164P1: D_R[2]                              ; GET THE IPL ACTIVE LEVEL
U 1391, 0000,003C,01C0,0A18,0000,1392     ;3102            Q_R[3]                              ; GET THE IPL LEVEL
U 1392, 001D,2000,0180,0800,0010,1393     ;3103            A[U_Q-D,CLK.UBCC                    ; CHECK WHICH IS GREATER
U 1393, 0000,1B3C,0180,0800,0000,1007     ;3104            ALU_N?                              ; BR IF INTR REQ TRUE
U 1007, 0003,003C,0180,09F0,0000,10AD     ;3105    =0111   RC[0E]_0,J/T164L1                   ; SET INTER REQ FALSE BR BIT
U 100F, 0018,0038,0580,09F0,0000,10AD     ;3106            RC[0E]_K[.1],J/T164L1               ; SET INTR REQ TRUE BRANCH BIT
                                          ;3107
                                          ;3108
                                          ;3109    ;////////////////////////////////////////////////////////////
                                          ;3110    ;+
                                          ;3111    ; NOW CHECK INTERUPT REQUEST AT IPL ACTIVE 4 AND NOT IPL 4
                                          ;3112    ;-
                                          ;3113
U 1394, 0818,0038,3180,0800,0000,1395     ;3114    T164S2: D_K[.40]                            ; GENERATE INTERRUPT ENABLE BIT
U 1395, 0000,003C,1980,3C00,0000,10B6     ;3115            ID[TXCS]_D                          ; CAUSE THE INTERUPT REQUEST
U 10B6, 0000,003D,0180,0800,0000,1189     ;3116    =0      SUBTEST
U 10B7, 0F00,003C,0180,0800,4000,1396     ;3117            INTRPT.STROBE,D_0                   ; LATCH THE INTERRUPT
U 1396, 0000,003C,3D80,3C00,0000,1397     ;3118            ID[PSL]_D                           ; CLEAR THE IPL LEVEL
U 1397, 0018,0038,0580,09F0,0000,10B8     ;3119            RC[0E]_K[.1]                        ; SET INTR REQ TRUE BR BIT
U 10B8, 0000,003D,0980,0800,0084,718B     ;3120    =0      SETRCF[.2]
U 10B9, 0000,003C,0180,0800,0000,10BA     ;3121            NOP
U 10BA, 0000,003D,0180,0800,0000,1181     ;3122    =0      ERLOOP
U 10BB, 0810,0E38,0180,0970,0000,1026     ;3123            D_RC[0E],AC.LOW?                    ; EXECUTE THE BRANCH
U 1026, 0000,003C,01F8,0800,0000,1398     ;3124    =110    Q_0,J/XX                            ; BRANCH BIT DID NOT ASSERT
U 1027, 0018,0038,05C0,0800,0000,1398     ;3125            Q_K[.1]                             ; BRANCH BIT ASSERTED
U 1398, 001D,A000,0180,0800,0010,1399     ;3126    XX:     A[U_Q-D,CLK.UBCC,BYTE               ; CHECK
U 1399, 0000,013C,0180,0800,0000,10BC     ;3127            Z?
U 10BC, 0001,203D,0180,09E8,0000,1184     ;3128    =0      ERROR2,RC[0D]_Q                     ; INTER REQUEST DID NOT ASCERT
                                          ;3129
```

```
                                            ;////////////////////////////////////////////////////////////////////////
                                            ;+
                                            ; NOW CHECK IPL ACTIVE 4*IPL 4*REQ GT IPL
                                            ;-

U 10BD, 0000,003C,0180,0800,0000,10BE       T164S3: NOP
U 10BE, 0000,003D,0180,0800,0000,1189       =0      SUBTEST
U 10BF, 0818,0038,65F8,0800,0082,139A               D_K[.10],SC_ALU,Q_0             ; GENERATE IPL OF 10
U 139A, 0D00,003C,0180,0800,0000,139B               D_DAL.SC                        ;
U 139B, 0000,003C,3D80,3C00,0000,10C0               ID[PSL]_D                       ; LOAD IPL OF 10
U 10C0, 0000,003D,0180,0800,0000,1181       =0      ERLOOP
U 10C1, 0810,0E38,0180,0970,0000,102E               D_RC[0E],AC.LOW?                ; EXECUTE THE BRANCH
U 102E, 0000,003C,01F8,0800,0000,139C       =110    Q_0,J/XXX                       ; BRANCH BIT DID NOT ASSERT
U 102F, 0018,0038,05C0,0800,0000,139C               Q_K[.1]                         ; BRANCH BIT ASSERTED
U 139C, 001D,A000,0180,0800,0010,139D       XXX:    A[U_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 139D, 0000,013C,0180,0800,0000,10C2               Z?
U 10C2, 0001,203D,0180,09E8,0000,1184       =0      ERROR2,RC[0D]_Q                 ; INTER REQ DID NOT SET

                                            ;////////////////////////////////////////////////////////////////////////
                                            ;+
                                            ; NOW CHECK IPL ACTIVE 4*IPL 4*-REQ GT IPL
                                            ;-

U 10C3, 0003,003C,0180,09F0,0000,10C4       T164S4: RC[0E]_0                        ; SET BRANCH BIT FALSE
U 10C4, 0000,003D,0180,0800,0000,1189       =0      SUBTEST
U 10C5, 0818,0038,21F8,0800,0000,139E               D_K[.14],Q_0                    ; GENERATE IPL VALUE
U 139E, 0D00,003C,0180,0800,0000,139F               D_DAL.SC
U 139F, 0000,003C,3D80,3C00,0000,10C6               ID[PSL]_D                       ; LOAD IPL OF 14
U 10C6, 0000,003D,0180,0800,0000,1181       =0      ERLOOP
U 10C7, 0810,0E38,0180,0970,0000,1036               D_RC[0E],AC.LOW?                ; EXECUTE THE BRANCH
U 1036, 0000,003C,01F8,0800,0000,13A0       =110    Q_0,J/XXXX                      ; BRANCH BIT DID NOT ASSERT
U 1037, 0018,0038,05C0,0800,0000,13A0               Q_K[.1]                         ; BRANCH BIT ASSERTED
U 13A0, 001D,A000,0180,0800,0010,13A1       XXXX:   A[U_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 13A1, 0000,013C,0180,0800,0000,10C8               Z?
U 10C8, 0001,203D,0180,09E8,0000,1184       =0      ERROR2,RC[0D]_Q                 ; INTER REQ DID NOT DEASSERT
U 10C9, 0F00,003C,0180,0800,0000,13A2               D_0
U 13A2, 0000,003C,1980,3C00,0000,13A3               ID[TXCS]_D                      ; CLEAR IE BIT
U 13A3, 0000,003C,0180,0800,8000,13A4               INTRPT.ACK                      ; CLEAR THE INTERRUPT REQUEST
U 13A4, 0000,003C,0180,0800,4000,10CA               INTRPT.STROBE                   ; CLEAR THE IPL ACTIVE

```

```
                                       ;3171   .PAGE   "TEST 165       INSTRUCTION BUFFER SERVICE BIT GENERATION"
                                       ;3172   ;*************************************************************************
                                       ;3173   ;++
                                       ;3174   ; TEST  165     INSTRUCTION BUFFER SERVICE BIT GENERATION
                                       ;3175   ;
                                       ;3176   ; TEST DESCRIPTION
                                       ;3177   ;       THIS TEST CHECKS THE GENERATION OF THE SERVICE BITS TO THE
                                       ;3178   ;       INSTRUCTION BUFFER. THIS IS DONE BY LOADING THE INSTRUCTION
                                       ;3179   ;       BUFFER WITH VALID DATA, ENABLING THE "SERVICE" SIGNAL ON ICL,
                                       ;3180   ;       AND EXECUTING THE SUB/SPEC FUNCTION, AND CHECKING THE RESULTANT
                                       ;3181   ;       MICRO PC BITS <7:0>.
                                       ;3182   ;
                                       ;3183   ;       SUBTST 1 - CHECK INTR REQ AND PSL TP TRUE AND HALT PENDING FALSE.
                                       ;3184   ;       SUBTST 2 - CHECK PSL TP TRUE AND INTR REQ AND HALT PENDING FALSE.
                                       ;3185   ;       SUBTST 3 - CHECK INTERN REQ TRUE AND "SERVICE" TRUE DUE TO
                                       ;3186   ;                  ARITHMETIC TRAP BEING TRUE. EACH OF THE THREE TRAP CODES
                                       ;3187   ;                  IS CHECKED INDIVIDUALLY TO ENSURE THEY ENABLE THE
                                       ;3188   ;                  ARITHMETIC TRAP.
                                       ;3189   ;
                                       ;3190   ; LOGIC DESCRIPTION
                                       ;3191   ;       THIS TEST CHECKS THE MULTIPLEXOR THAT FEEDS THE INSTRUCTION BUFFER
                                       ;3192   ;       SERVICE BITS ON THE ICL MODULE. IT ALSO CHECKS THE LOGIC
                                       ;3193   ;       ON THE IRC MODULE THAT GENFRATES THE "SRV+INV" SIGNAL FROM THE
                                       ;3194   ;       "SERVICE" SIGNAL ON ICL.
                                       ;3195   ;
                                       ;3196   ; ERROR DESCRIPTION
                                       ;3197   ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                       ;3198   ;             RECEIVED MICRO PC BITS <7:0>
                                       ;3199   ;             LOOP COUNT - SUBTST 3 ONLY -- INDICATES WHICH ARITHMETIC
                                       ;3200   ;               TRAP CODE SHOULD BE CAUSING THE ARITHMETIC TRAP, I.E.
                                       ;3201   ;               3= TRAP CODE 0, 2= TRAP CODE 1, 1= TRAP CODE 2
                                       ;3202   ;
                                       ;3203   ; SYNC POINT DESCRIPTION
                                       ;3204   ;       ADDRESS SYNC00 - MICRO PC BITS <7:0> ARE ENABLED FROM THE INSTRUCTION
                                       ;3205   ;                        BUFFER AT THE MICROINSTRUCTION FOLLOWING THIS ONE.
                                       ;3206   ;                        SERVICE BITS ARE VALID AT THIS INSTRUCTION.
                                       ;3207   ;--
                                       ;3208   ;*********************************************************************
                                       ;3209   =0
U 10CA, 0018,0039,0980,09F8,0000,116D  ;3210   T165:   NEWTST[.2]
U 10CB, 0000,003C,0180,0800,0000,10CC  ;3211           NOP
U 10CC, 0000,003D,0180,0800,0000,11A4  ;3212   =0      CALL,J/UNJAM                    ; CLEAR ANY SBI INTERRUPTS
                                       ;3213
                                       ;3214   ;//////////;////////////////////////////////////////////////////////////
                                       ;3215   ;+
                                       ;3216   ; FIRST CHECK -HP*PSL TP*INTR REQ
                                       ;3217   ;-
                                       ;3218
U 10CD, 0018,0038,7980,09F0,0000,10CE  ;3219   T165S1: RC[0E]_K[.30]                   ; SET THE EXPECTED ADDRESS
U 10CE, 0000,003D,0180,0800,0000,1189  ;3220   =0      SUBTEST
U 10CF, 0818,0038,3180,0800,0000,13A5  ;3221           D_K[.40]
U 13A5, 0800,003C,6580,0800,0000,13A6  ;3222           D_D.SWAP,KMX/.10                ; GENERATE PSL DATA
U 13A6, 0819,0014,6580,0A80,0000,13A7  ;3223           D_D+K[.10],R[0]_ALU             ; ADD THE T BIT
U 13A7, 0000,003C,3D80,3C00,0000,13A8  ;3224           ID[PSL]_D                       ; LOAD THE PSL
U 13A8, 0818,0038,0980,0800,0000,13A9  ;3225           D_K[.2]                         ; SET SIR FOR IPL ACTIVE OF 1
```

```
U 13A9, 0F00,003C,3980,3C00,0000,13AA   ;3226           ID[SIR]_D,D_0
U 13AA, 0000,003C,3180,3C00,0000,10D0   ;3227           ID[CES]_D                       ; ENSURE TRAP CODES ARE CLEAR
U 10D0, 0000,003D,0180,0800,0000,1181   ;3228   =0      ERLOOP
U 10D1, 0000,003C,0180,0800,0000,10D2   ;3229           NOP
U 10D2, 2003,003D,0180,0800,4200,119D   ;3230   =0      ALU_O(A),FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10D3, 0810,0038,0180,0970,0000,10D4   ;3231           D_RC[0E]                        ; GET EXPECTED ADDRESS
U 10D4, 0000,003D,0180,0800,0000,119C   ;3232   =0      CALL,J/CALL3                    ; EXECUTE THE A FORK
U 10D5, 001D,A000,0180,0800,0010,13AB   ;3233           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 13AB, 0000,013C,0180,0800,0000,10D6   ;3234           Z?
U 10D6, 0001,203D,0180,09E8,0000,1184   ;3235   =0      ERROR2,RC[0D]_Q                 ; SERVICE BITS INCORRECT
                                        ;3236
                                        ;3237   ;///////////!//////////////////////////////////////////////////////
                                        ;3238   ;+
                                        ;3239   ; NOW CHECK -HP*PSL TP*-INTR REQ
                                        ;3240   ;-
                                        ;3241
U 10D7, 0018,0038,E980,09F0,0000,10D8   ;3242   T165S2: RC[0E]_K[.24]                   ; SET THE EXPECTED ADDRESS
U 10D8, 0000,003D,0180,0800,0000,1189   ;3243   =0      SUBTEST
U 10D9, 0800,003C,0180,0A00,0000,13AC   ;3244           D_R[0]                          ; GET PSL DATA
U 13AC, 0F00,003C,3D80,3C00,0000,13AD   ;3245           ID[PSL]_D,D_0                   ; LOAD THE TP BIT
U 13AD, 0000,003C,3980,3C00,0000,10DA   ;3246           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
U 10DA, 0000,003D,0180,0800,0000,1181   ;3247   =0      ERLOOP
U 10DB, 0000,003C,0180,0800,0000,10DC   ;3248           NOP
U 10DC, 2003,003D,0180,0800,4200,119D   ;3249   =0      ALU_O(A),FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10DD, 0810,0038,0180,0970,0000,10DE   ;3250           D_RC[0E]
U 10DE, 0000,003D,0180,0800,0000,119C   ;3251   =0      CALL,J/CALL3                    ; EXECUTE THE A FORK
U 10DF, 001D,A000,0180,0800,0010,13AE   ;3252           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE ADDRESS
U 13AE, 0000,013C,0180,0800,0000,10E0   ;3253           Z?
U 10E0, 0001,203D,0180,09E8,0000,1184   ;3254   =0      ERROR2,RC[0D]_Q                 ; SERVICE BITS INCORRECT
                                        ;3255
                                        ;3256   ;//////////////////////////////////////////////////////////////////
                                        ;3257   ;+
                                        ;3258   ; NOW CHECK THAT IRD STATE AND ARITH TRAP GENERATE THE CORRECT
                                        ;3259   ; SERVICE BITS
                                        ;3260   ;-
                                        ;3261
U 10E1, 0000,003C,0180,0800,0000,10E2   ;3262   T165S3: NOP
U 10E2, 0000,003D,0D80,0800,0084,718B   ;3263   =0      SETRCF[.3]
U 10E3, 0000,003C,0180,0800,0000,10E4   ;3264           NOP
U 10E4, 0818,0039,0D80,0800,0000,1186   ;3265   =0      D_K[.3],CALL,J/DCC              ; GENERATE THE EXPECTED ADDRESS
U 10E5, 0001,003C,0180,09F0,0000,10E6   ;3266           RC[0E]_D
U 10E6, 0000,003D,0180,0800,0000,1189   ;3267   =0      SUBTEST
U 10E7, 0818,0038,7580,0800,0000,13AF   ;3268           D_K[.20]                        ; SET THE IV BIT IN THE PSL
U 13AF, 0000,003C,3D80,3C00,0000,13B0   ;3269           ID[PSL]_D
U 13B0, 0F18,0038,6580,0A80,0000,13B1   ;3270           R[0]_K[.10],D_0                 ; SET INITIAL CES DATA
U 13B1, 0000,003C,3980,3C00,0000,13B2   ;3271           ID[SIR]_D                       ; CLEAR THE SIR REGISTER
                                        ;3272
U 13B2, 0018,0038,0D80,09E0,0000,13B3   ;3273           RC[0C]_K[.3]                    ; SET THE LOOP COUNT
U 13B3, 0800,003C,0180,0A00,0000,13B4   ;3274   T165L1: D_R[0]                          ; GET THE CES DATA
U 13B4, 0000,003C,3180,3C00,0000,10E8   ;3275           ID[CES]_D                       ; LOAD THE ARITH TRAP CODE
U 10E8, 0000,003D,0180,0800,0000,1181   ;3276   =0      ERLOOP
U 10E9, 0000,003C,0180,0800,0000,10EA   ;3277           NOP
U 10EA, 2003,003D,0180,0800,4200,119D   ;3278   =0      ALU_O(A),FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 10EB, 0810,0038,0180,0970,0000,10EC   ;3279           D_RC[0E]
U 10EC, 0000,003D,0180,0800,0000,119C   ;3280   =0      CALL,J/CALL3                    ; EXECUTE THE A FORK
```

```
U 10ED, 001D,A000,0180,0800,0010,13B5   ;3281          ALU_Q-D,CLK.UBCC,BYTE            ; CHECK THE ADDRESS
U 13B5, 0000,013C,0180,0800,0000,10EE   ;3282          Z?
U 10EE, 0001,203D,0180,09E8,0000,1184   ;3283   =0     ERROR2,RC[0D]_Q                  ; SERVICE BITS INCORRECT
U 10EF, 0800,003C,0180,0A00,0000,13B6   ;3284          D_R[0]                           ; GET CES DATA
U 13B6, 0500,003C,0180,0800,0000,13B7   ;3285          D_D.LEFT                         ; GENERATE NEXT DATA PATTERN
U 13B7, 0001,003C,0180,0A80,0000,13B8   ;3286          R[0]_D
U 13B8, 0810,0038,0180,0960,0000,13B9   ;3287          D_RC[0C]
U 13B9, 0019,8000,0580,09E0,0010,13BA   ;3288          RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT THE LOOP COUNT
U 13BA, 0000,013C,0180,0800,0000,10F0   ;3289          Z?
U 10F0, 0000,003C,0180,0800,0000,13B3   ;3290   =0     J/T165L1                         ; CONTINUE
U 10F1, 0000,003C,0180,0800,0000,10F2   ;3291          NOP
                                        ;3292
```

```
                                         .PAGE   "TEST 166       HALT PENDING BIT"
                                         ;**********************************************************************
                                         ;++
                                         ;
                                         ; TEST  166     HALT PENDING (HP) BIT
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS TEST CHECKS THAT THE HALT PENDING BIT SETS AND CLEARS
                                         ;       CORRECTLY AND THAT IT CONTROLS THE INSTRUCTION BUFFER SERVICE
                                         ;       BITS CORRECTLY. THIS IS DONE BY SETTING OR CLEARING THE HP BIT
                                         ;       AND EXECUTING THE SUB/SPEC FUNCTION IN THE IB AND CHECKING THAT
                                         ;       THE CORRECT ADDRESS IS ASSERTED.
                                         ;
                                         ;       SUBTST 1 - CHECK THAT THE HP BIT IS SET WITH THE HALT REQ
                                         ;                  FROM THE CONSOLE DURING AN INTERRUPT ACK AND THE
                                         ;                  IB IS IN A STALL.
                                         ;       SUBTST 2 -CHECKS THAT THE HP BIT CLEARS WHEN A
                                         ;                  CONSOLE CONTINUE FUNCTION IS EXECUTED.
                                         ;       SUBTST 3 - CHECK THAT THE HP BIT CLEARS WHEN LOADED WITH THE HALT
                                         ;                  REQ BIT AND THE HALT REQ BIT IS CLEAR.
                                         ;                  THESE THREE SUBTESTS IMPLICETLY CHECKS THAT THE HP BIT IS LOADED
                                         ;                  WITH ITSELF DURING AN IRD STATE AND THE IB IS STALLING.
                                         ;       SUBTST 4 - CHECK THAT THE HP BIT IS LOADED WITH THE HALT REQ BIT
                                         ;                  FROM THE CONSOLE WHEN THE IB IS NOT DOING A STALL.
                                         ;       SUBTST 5 - CHECK THAT THE HP BIT IS LOADED WITH ITSELF WHEN AN
                                         ;                  INTERRUPT ACK IS ISSUED AND THE IB IS NOT STALLING.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;       THIS TEST CHECKS THE MULTIPLEXOR THAT FEEDS THE HP BIT ON THE ICL
                                         ;       MODULE, AND THE MULTIPLEXOR SELECT LINE FOR THE IB SERVICE BITS. IT
                                         ;       ALSO CHECKS THAT THE SERVICE SIGNAL ASSERTS WHEN HP IS TRUE.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       DATA: EXPECTED MICRO PC BITS <7:0>
                                         ;             RECEIVED MICRO PC BITS <7:0>
                                         ;
                                         ;       NOTE: THE EXPECTED DATA SHOULD EITHER BE 34 OR 62 DEPENDING ON
                                         ;               WHETHER THE HP BIT IS SET OR CLEAR.
                                         ;
                                         ; SYNC POINT DESCRIPTION
                                         ;       ADDRESS SYNC00--MICRO PC BITS ARE ASSERTED AT THE INSTRUCTION AFTER
                                         ;                       THIS INSTRUCTION. HP BIT SHOULD LOAD WITH ITSELF
                                         ;                       DURING THIS INSTRUCTION.
                                         ;       SUBTST 1 - SYNC20--HP BIT IS LOADED FROM THE HALT REQ SIGNAL.
                                         ;       SUBTST 2 - SYNC21--MUX SHOULD BE DISABLED THAT FEEDS HP BIT
                                         ;       SUBTST 3 - SYNC22--HP BIT IS LOADED FROM THE HALT REQ SIGNAL.
                                         ;       SUBTST 4 - SYNC23--HP BIT IS LOADED FROM THE HALT REQ SIGNAL.
                                         ;                  SYNC24--HP BIT IS LOADED FROM THE HALT REQ SIGNAL.
                                         ;       SUBTST 5 - SYNC25--HP BIT IS LOADED FROM ITSELF.
                                         ;                  SYNCB6--HP IS LOADED FROM ITSELF.
                                         ;--
                                         ;**********************************************************************
                                         =0
U 10F2, 0018,0039,0980,09F8,0000,116D    T166:   NEWTST[.2]
U 10F3, 0018,0038,2980,0A80,0000,10F4            R[0]_K[.34]                   ; GEN ADDRESS OF IB DISPATCH
```

```
                                                                          ; WHEN THE SERVICE SIGNAL IS TRUE
U 10F4, 0000,003D,0180,0800,0000,11A4     =0      CALL,J/UNJAM            ; CLEAR ANY SBI INTERRUPTS
U 10F5, 0818,0038,A580,0800,0000,13BB             D_K[.60]                ; GENERATE ADR OF IB DISPATCH
U 13BB, 0019,0014,0980,0A90,0000,13BC             R[2]_D+K[.2]            ; WHEN THE SERVICE SIGNAL IS FALSE
U 13BC, 0003,003C,0180,0A88,0000,10F6             R[1]_0                  ; SET ADDRESS OF IB DATA

                                          ;//////////////////////////////////////////////////////////////////////
                                          ;+
                                          ; HP_HALT REQ => STALL+SVC * IACK
                                          ;-

                                          =0
U 10F6, 0018,0039,4580,0AD0,0000,118E     T166S1: SETMCR[.8000]                   ; SET THE HALT REQ BIT IN THE CONSOLE
U 10F7, 2000,003C,0180,0A00,0000,10F8             IBC/FLUSH,LAB_R[0]              ; ASSERT STALL+SVC
U 10F8, 0000,003D,0180,0800,0000,1189     =0      SUBTEST
U 10F9, 0000,003C,0180,09F0,0000,10FA             RC[0E]_LA                       ; GET EXPECTED IB ADDRESS
U 10FA, 0000,003D,0180,0800,0000,1181     =0      ERLOOP
U 10FB, 0810,0038,0180,0970,9000,10FC     SYNC20: INTRPT.ACK,MSC/IRD,D_RC[0E]     ; EXECUTE THE TEST
U 10FC, 0000,003D,0180,0800,0000,119C     =0      CALL,J/CALL3                    ; GET THE IB MICRO PC BITS
U 10FD, 001D,A000,0180,0800,0010,13BD             ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 13BD, 0000,013C,0180,0800,0000,10FE             Z?
U 10FE, 0001,203D,0180,09E8,0000,1184     =0      ERROR2,RC[0D]_Q                 ; HP DID NOT SET OR SERVICE MUX FAILED

                                          ;//////////////////////////////////////////////////////////////////////
                                          ;+
                                          ; CHECK THAT THE HP BIT CLEARS WHEN A CONSOLE CONTINUE FUCTION IS EXECUTED
                                          ;-

U 10FF, 0000,003C,0180,0A10,0000,110A     T166S2: LAB_R[2]
U 110A, 0000,003D,0180,0800,0000,1189     =0      SUBTEST
U 110B, 0000,003C,0180,09F0,0000,1110             RC[0E]_LA                       ; GET EXPECTED IB ADDRESS
U 1110, 0000,003D,0180,0800,0000,1181     =0      ERLOOP
U 1111, 0000,003C,0180,0800,0000,1112             NOP
U 1112, 0000,003D,0180,0800,0000,100A     =0      CALL,J/SETHP                    ; SET THE HALT PENDING BIT
U 1113, 0000,003C,0180,0800,0000,1114             NOP
U 1114, 0018,0039,4580,0AD0,0000,118E     =0      SETMCR[.8000]                   ; SET THE HALT REQ SIGNAL
U 1115, 0810,0038,0180,1D70,9000,1116     SYNC21: CID/CONT,MSC/IRD,INTRPT.ACK,D_RC[0E] ; EXECUTE THE TEST
U 1116, 0000,003D,0180,0800,0000,119C     =0      CALL,J/CALL3                    ; GET THE IB ADDRESS
U 1117, 001D,A000,0180,0800,0010,13BE             ALU_Q-D,CLK.UBCC,BYTE           ; CHECK IT
U 13BE, 0000,013C,0180,0800,0000,1118             Z?
U 1118, 0001,203D,0180,09E8,0000,1184     =0      ERROR2,RC[0D]_Q                 ; HP DID NOT CLEAR

                                          ;//////////////////////////////////////////////////////////////////////
                                          ;+
                                          ; NOW CHECK THAT THE HP BIT CLEARS WHEN THE HALT REQ SIGNAL IS FALSE.
                                          ;-

U 1119, 0000,003C,0180,0A10,0000,111A     T166S3: LAB_R[2]
U 111A, 0000,003D,0180,0800,0000,1189     =0      SUBTEST
U 111B, 0000,003C,0180,09F0,0000,111C             RC[0E]_LA                       ; GET THE EXPECTED DATA
U 111C, 0018,0039,1980,0AD0,0000,118E     =0      SETMCR[ZERO]                    ; CLEAR THE HALT REQ BIT
U 111D, 0000,003C,0180,0800,0000,111E             NOP
U 111E, 0000,003D,0180,0800,0000,1181     =0      ERLOOP
U 111F, 0000,003C,0180,0800,0000,1120             NOP
U 1120, 0000,003D,0180,0800,0000,100A     =0      CALL,J/SETHP                    ; SET THE HP BIT
```

```
U 1121, 0810,0038,0180,0970,9000,1122   ;3403   SYNC22: INTRPT.ACK,MSC/IRD,D_RC[0E]     ; EXECUTE THE TEST
U 1122, 0000,003D,0180,0800,0000,119C   ;3404   =0      CALL,J/CALL3                    ; GET THE IB MICRO PC BITS
U 1123, 001D,A000,0180,0800,0010,13BF   ;3405           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THEM
U 13BF, 0000,013C,0180,0800,0000,1124   ;3406           Z?
U 1124, 0001,203D,0180,09E8,0000,1184   ;3407   =0      ERROR2,RC[0D]_Q                 ; HP BIT DID NOT CLEAR
                                        ;3408
                                        ;3409   ;//////////////////////////////////////////////////////////////////////
                                        ;3410   ;+
                                        ;3411   ; HP_HALT REQ => -(STALL+SVC) * IRD STATE
                                        ;3412   ;-
                                        ;3413
U 1125, 0000,003C,0180,0A00,0000,1126   ;3414   T166S4: LAB_R[0]
U 1126, 0000,003D,0180,0800,0000,1189   ;3415   =0      SUBTEST
U 1127, 0000,003C,0180,09F0,0000,1128   ;3416           RC[0E]_LA                       ; GET THE EXPECTED IB ADDRESS
U 1128, 0018,0039,4580,0AD0,0000,118E   ;3417   =0      SETMCR[.8000]                   ; SET THE HALT REQ BIT
U 1129, 0000,003C,0180,0800,0000,112A   ;3418           NOP
U 112A, 2000,003D,0180,0A08,4200,119D   ;3419   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 112B, 0000,003C,0180,0800,0000,112C   ;3420           NOP
U 112C, 0000,003D,0180,0800,0000,1181   ;3421   =0      ERLOOP
U 112D, 0000,003C,0180,1C00,0000,13C0   ;3422           CID/CONT                        ; CLEAR THE HP BIT
U 13C0, 0810,0038,0180,0970,1000,112E   ;3423   SYNC23: MSC/IRD,D_RC[0E]                ; EXECUTE THE TEST, SET HP BIT
U 112E, 0000,003D,0180,0800,0000,119C   ;3424   =0      CALL,J/CALL3                    ; GET IB MICRO PC BITS
U 112F, 001D,A000,0180,0800,0010,13C1   ;3425           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 13C1, 0000,013C,0180,0800,0000,1130   ;3426           Z?
U 1130, 0001,203D,0180,09E8,0000,1184   ;3427   =0      ERROR2,RC[0D]_Q                 ; HP BIT DID NOT SET
                                        ;3428
                                        ;3429   ;+
                                        ;3430   ; NOW CHECK THAT THE HP BIT CLEARS WHEN HALT REQ IS CLEAR
                                        ;3431   ;-
                                        ;3432
U 1131, 0000,003C,0180,0A10,0000,13C2   ;3433           LAB_R[2]
U 13C2, 0000,003C,0180,09F0,0000,1132   ;3434           RC[0E]_LA                       ; GET EXPECTED IB ADDRESS
U 1132, 0000,003D,0180,0800,0000,1181   ;3435   =0      ERLOOP
U 1133, 0000,003C,0180,0800,0000,1134   ;3436           NOP
U 1134, 0000,003D,0180,0800,0000,100A   ;3437   =0      CALL,J/SETHP                    ; SET THE HP BIT
U 1135, 0000,003C,0180,0800,0000,1136   ;3438           NOP
U 1136, 2000,003D,0180,0A08,4200,119D   ;3439   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1137, D000,003C,0180,0800,0000,13C3   ;3440           IBC7CLR.1                       ; GET OUT OF EXEC POINT 0
U 13C3, 0810,0038,0180,0970,1000,13C4   ;3441   SYNC24: MSC/IRD,D_RC[0E]                ; EXECUTE THE TEST, HP CLEARS
U 13C4, 2000,003C,0180,0800,0000,1138   ;3442           IBC/FLUSH                       ; ASSERT STALL+SVC
U 1138, 0000,003D,0180,0800,0000,119C   ;3443   =0      CALL,J/CALL3                    ; GET MICRO PC BITS
U 1139, 001D,A000,0180,0800,0010,13C5   ;3444           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 13C5, 0000,013C,0180,0800,0000,113A   ;3445           Z?
U 113A, 0001,203D,0180,09E8,0000,1184   ;3446   =0      ERROR2,RC[0D]_Q                 ; HP BIT DID NOT CLEAR
                                        ;3447
                                        ;3448   ;//////////////////////////////////////////////////////////////////////
                                        ;3449   ;+
                                        ;3450   ; HP_HP => -(STALL+SVC) * IACK * IRD STATE
                                        ;3451   ;+
                                        ;3452
U 113B, 0000,003C,0180,0A10,0000,113C   ;3453   T166S5: LAB_R[2]
U 113C, 0000,003D,0180,0800,0000,1189   ;3454   =0      SUBTEST
U 113D, 0000,003C,0180,09F0,0000,113E   ;3455           RC[0E]_LA                       ; GET EXPECTED IB ADDRESS
U 113E, 0000,003D,0180,0800,0000,1181   ;3456   =0      ERLOOP
U 113F, 0000,003C,0180,0800,0000,1140   ;3457           NOP
```

```
U 1140, 2000,003D,0180,0A08,4200,119D   ;3458   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1141, 0F00,003C,0180,1C00,0000,13C6   ;3459           CID7CONT,D_0                    ; CLEAR THE HP BIT
U 13C6, 0000,003C,0180,3C00,9000,13C7   ;3460   SYNC25: MSC/IRD,INTRPT.ACK,ID[IBUF]_D   ; EXECUTE THE TEST
U 13C7, 2810,0038,0180,0970,0000,1142   ;3461           IBC/FLUSH,D_RC[0E]              ; ASSERT STALL+SVC
U 1142, 0000,003D,0180,0800,0000,119C   ;3462   =0      CALL,J/CALL3                    ; GET MICRO PC BITS
U 1143, 001D,A000,0180,0800,0010,13C8   ;3463           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 13C8, 0000,013C,0180,0800,0000,1144   ;3464           Z?
U 1144, 0001,203D,0180,09E8,0000,1184   ;3465   =0      ERROR2,RC[0D]_Q                 ; HP DID NOT REMAIN CLEAR
                                        ;3466
                                        ;3467   ;+
                                        ;3468   ; NOW CHECK THAT HP_HP WHEN THE HP IS INITIALLY SET
                                        ;3469   ;-
                                        ;3470
U 1145, 0000,003C,0180,0A00,0000,13C9   ;3471           LAB_R[0]
U 13C9, 0000,003C,0180,09F0,0000,1146   ;3472           RC[0E]_LA                       ; GET EXPECTED IB ADDRESS
U 1146, 0000,003D,0180,0800,0000,1181   ;3473   =0      ERLOOP
U 1147, 0000,003C,0180,0800,0000,1148   ;3474           NOP
U 1148, 0000,003D,0180,0800,0000,100A   ;3475   =0      CALL,J/SETHP                    ; SET THE HP BIT
U 1149, 0000,003C,0180,0800,0000,114A   ;3476           NOP
U 114A, 2000,003D,0180,0A08,4200,119D   ;3477   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 114B, DF00,003C,0180,0800,0000,13CA   ;3478           IBC7CLR.1,D_0                   ; GO TO EXEC POINT 1
U 13CA, 0810,0038,0180,3D70,9000,13CB   ;3479   SYNCB6: MSC/IRD,INTRPT.ACK,ID[IBUF]_D,D_RC[0E] ; EXECUTE THE TEST
U 13CB, 2000,003C,0180,0800,0000,114C   ;3480           IBC/FLUSH                       ; ASSERT STALL+SVC
U 114C, 0000,003D,0180,0800,0000,119C   ;3481   =0      CALL,J/CALL3                    ; GET THE MICRO PC BITS
U 114D, 001D,A000,0180,0800,0010,13CC   ;3482           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK
U 13CC, 0000,013C,0180,0800,0000,114E   ;3483           Z?
U 114E, 0001,203D,0180,09E8,0000,1184   ;3484   =0      ERROR2,RC[0D]_Q                 ; HP DID NOT REMAIN SET
U 114F, 0000,003C,0180,1C00,0000,1150   ;3485           CID/CONT                        ; CLEAR THE HP BIT
                                        ;3486
                                        ;3487
                                        ;3488   ; THE FOLLOWING IS THE IB DATA FOR THIS TEST
                                        ;3489   ;% 0
                                        ;3490   ;$ 6090,0050
                                        ;3491
                                        ;3492
```

```
                                         .PAGE   "TEST 167        PC REGISTER INCREMENT BY 'N' WITH 'SAVE' ACTIVE"
                                         ;**********************************************************************
                                         ;++
                                         ; TEST  167     PC REGISTER INCREMENT BY "N" WITH "SAVE" ACTIVE
                                         ;
                                         ; TEST DESCRIPTION
                                         ;       THIS TEST CHECKS THAT "SAVE" DISABLES THE CONSTANTS THAT ARE USED
                                         ;       TO INCREMENT THE PC WITH A PC GETS PC+N FUNCTION.
                                         ;       FIRST THE PSL TP BIT IS SET TO ACTIVATE THE IB STALL, THEN
                                         ;       THE IB IS LOADED WITH THREE DIFFERENT SPECIFIERS, THE PC IS CLEARED
                                         ;       THE PC IS THEN INCREMENTED BY THE IB DISPLACEMENT AND READ INTO
                                         ;       THE Q REGISTER AND CHECKED.
                                         ;
                                         ;       SUBTEST 1 - CHECK THAT THE INCREMENT IS NOT DISABLED IF A CALL3
                                         ;                   IS NOT EXECUTED SIMULTANEOUSLY WITH THE PC_PC+N.
                                         ;
                                         ;       SUBTEST 2 - CHECK THAT THE INCREMENT IS DISABLED WHEN "SRV+INV"
                                         ;                   IS TRUE.
                                         ;
                                         ; LOGIC DESCRIPTION
                                         ;       THIS TEST CHECKS THAT THE SIGNALS "DELTA PC 0", "DELTA PC 1", AND
                                         ;       "DELTA PC 2", FROM THE IDP MODULE, ARE DISABLED DURING AN IB STALL.
                                         ;
                                         ; ERROR DESCRIPTION
                                         ;       DATA: EXPECTED VALUE OF THE PC REGISTER
                                         ;             RECEIVED VALUE OF THE PC REGISTER
                                         ;
                                         ; SYNC POINT DESCRIPTION
                                         ;       ADDRESS SYNCFE--DELTA PC SIGNALS ARE ADDED TO PC
                                         ;--
                                         ;************************************************************************
                                         =0
U 1150, 0018,0039,0980,09F8,0000,116D    T167:   NEWTST[.2]
U 1151, 0000,003C,0180,0800,0000,1152            NOP
                                         =0      R[1]_K[.8],             ; SET ADR OF IB DATA
U 1152, 0018,0039,0180,0A88,0000,11A4                CALL[UNJAM]         ; CLEAR ANY SBI INTERRUPTS

                                         ;////////////////////////////////////////////////////////////////////////
                                         ;+
                                         ; START THE TEST
                                         ;-

U 1153, 0818,0038,3180,0800,0000,13CD            D_K[.40]
U 13CD, 0B00,003C,0180,0800,0000,13CE            D_D.SWAP                        ; GENERATE DATA TO SET TP BIT
U 13CE, 0000,003C,3D80,3C00,0000,1156            IB[PSL]_D                       ; SET THE TP BIT IN THE PSL
U 1156, 0000,003D,0180,0800,0000,1189    =0      SUBTEST
U 1157, 001B,0010,1180,09F0,0000,1158            RC[0E]_0+K[.4]+1                ; SET THE EXPECTED DATA
U 1158, 0000,003D,0180,0800,0000,1181    =0      ERLOOP
U 1159, 0000,003C,0180,0800,0000,115A            NOP
U 115A, 2000,003D,0180,0A08,4200,119D    =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 115B, 0018,0038,1980,0800,0200,13CF            ALU_O(K),VA_ALU                 ; LOAD THE VA
U 13CF, 0810,0038,0180,0971,0000,13D0            PC_VA,D_RC[0E]                  ; LOAD THE PC
U 13D0, 0000,003C,0180,0807,0000,13D1            PC_PC+N                         ; EXECUTE THE TEST
U 13D1, 0014,0038,01C0,0800,0000,13D2            Q_PC                            ; READ THE PC
U 13D2, 001D,2000,0180,0800,0010,13D3            ALU_Q-D,CLK.UBCC                ; CHECK THE PC
```

```
U 13D3, 0000,013C,0180,0800,0000,115C   ;3548           Z?                             ; BRANCH IF OK
U 115C, 0001,203D,0180,09E8,0000,1184   ;3549   =0      ERROR2,RC[0D]_Q
                                        ;3550
                                        ;3551
                                        ;3552   ;////////////////////////////////////////////////////////////////////////
                                        ;3553   ;+
                                        ;3554   ; NOW CHECK IT WITH THE CALL3 SIGNAL ACTIVE
                                        ;3555   ;-
                                        ;3556
U 115D, 0018,0038,0D80,09E0,0000,13D4   ;3557   T167S2: RC[0C]_K[.3]                   ; SET THE LOOP COUNT
U 13D4, 0818,0038,3180,0800,0000,13D5   ;3558           D_K[.40]
U 13D5, 0B00,003C,0180,0800,0000,13D6   ;3559           D_D.SWAP                       ; GENERATE DATA TO SET TP BIT
U 13D6, 0000,003C,3D80,3C00,0000,115E   ;3560           ID[PSL]_D                      ; SET THE TP BIT IN THE PSL
U 115E, 0000,003D,0180,0800,0000,1189   ;3561   =0      SUBTEST
U 115F, 0003,003C,0180,09F0,0000,1160   ;3562   T167L1: RC[0E]_0                       ; SET THE EXPECTED DATA
U 1160, 0000,003D,0180,0800,0000,1181   ;3563   =0      ERLOOP
U 1161, 0000,003C,0180,0800,0000,1162   ;3564           NOP
U 1162, 2000,003D,0180,0A08,4200,119D   ;3565   =0      ALU_R[1],FLUSH.IB,CALL,J/IBWAIT ; LOAD THE IB
U 1163, 0018,0038,1980,0800,0200,13D7   ;3566           ALU_0(K),VA_ALU                ; LOAD THE VA
U 13D7, 0810,0038,0180,0971,0000,1164   ;3567           PC_VA,D_RC[0E]                 ; LOAD THE PC
U 1164, 0000,003D,0180,0800,0000,13E0   ;3568   =0      CALL,J/CALL3ANDPCINCREMENT     ; GO EXECUTE THE PC_PC+N
U 1165, 0014,0038,01C0,0800,0000,13D8   ;3569           Q_PC                           ; READ THE PC
U 13D8, 001D,2000,0180,0800,0010,13D9   ;3570           ALU_Q-D,CLK.UBCC               ; CHECK THE PC
U 13D9, 0000,013C,0180,0800,0000,1166   ;3571           Z?                             ; BRANCH IF OK
U 1166, 0001,203D,0180,09E8,0000,1184   ;3572   =0      ERROR2,RC[0D]_Q
U 1167, 0000,003C,0180,0A08,0000,13DA   ;3573           LAB_R[1]
U 13DA, 0018,0014,0980,0A88,0000,13DB   ;3574           R[1]_LA+K[.2]                  ; INCREMENT ADR OF IB DATA
U 13DB, 0000,003C,0180,0A00,0000,13DC   ;3575           LAB_R[0]
U 13DC, 0018,0014,0580,0A80,0000,13DD   ;3576           R[0]_LA+K[.1]                  ; INCREMENT ADR OF EXP DATA
U 13DD, 0810,0038,0180,0960,0000,13DE   ;3577           D_RC[0C]
U 13DE, 0019,8000,0580,09E0,0010,13DF   ;3578           RC[0C]_D-K[.1],CLK.UBCC,BYTE   ; DECREMENT THE LOOP COUNT
U 13DF, 0000,013C,0180,0800,0000,1168   ;3579           Z?
U 1168, 0000,003C,0180,0800,0000,115F   ;3580   =0      J/T167L1
U 1169, 0000,003C,0180,0800,0000,13E1   ;3581           J/ENDT167
                                        ;3582   ;
                                        ;3583   ; FOLLOWING IS THE IB DATA FOR THE ABOVE TEST
                                        ;3584   ;% 8
                                        ;3585   ;$ 9F90,8F90,C090
                                        ;3586   ;
                                        ;3587
                                        ;3588   CALL3ANDPCINCREMENT:
                                        ;3589
U 13E0, 0000,003F,0180,0807,0000,1200   ;3590   SYNCFE: SUB/SPEC,PC_PC+N,J/DISPATTBL   ; EXECUTE THE INCREMENT PC FUNCTION
                                        ;3591
                                        ;3592   ENDT167:
U 13E1, 0000,003D,0180,0800,0000,116D   ;3593   ENDTST: NEWTST
```

```
;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 0000 - 0FFF Unused
U 1000           1876:    1845     1847=    1866=    1867=    1868=    1846     3105=
U 1008           1884=    1885=    2032=    2033=    2034=    2035=    1869     3106=
U 1010           2950=    2951=    2952=    2953=    2954=    2955=    2956=    2957=
U 1018           2336=    2338=    2341=    2343=    2346=    2348=    3066=    3067=
U 1020           2423=    2431=    2434=    2435=    2436=    2437=    3124=    3125=
U 1028           2444=    2445=    2451=    2459=    2460=    2461=    3142=    3143=
U 1030           2462=    2463=    2470=    2471=    2477=    2487=    3160=    3161=
U 1038           2488=    2489=    2490=    2491=    2510=    2511=    2518=    2527=
U 1040           2528=    2529=    2530=    2531=    2532=    2533=    2539=    2540=
U 1048           2544=    2554=    2555=    2556=    2557=    2558=    1920:    1870
U 1050           2560=    2561=    2586=    2587=    2592=    2593=    2597=    2606=
U 1058           2607=    2608=    1924:    1871     2609=    2610=    1928:    1872
U 1060           2625=    2626=    2630=    2631=    2637=    2646=    2648=    2649=
U 1068           2650=    2651=    2678=    2679=    2684=    2685=    2737=    2738=
U 1070           2739=    2740=    2755=    2756=    2759=    2760=    2764=    2770=
U 1078           2771=    2772=    2777=    2783=    2786=    2787=    2792=    2798=
U 1080           2804=    2805=    2813=    2822=    2824=    2825=    2829=    2830=
U 1088           2840=    2846=    2847=    2848=    2849=    2850=    2855=    2856=
U 1090           2860=    2861=    2869=    2870=    2877=    2878=    2907=    2908=
U 1098           2917=    2918=    2919=    2920=    2921=    2922=    2924=    2931=
U 10A0           2932=    2933=    2934=    2935=    2936=    2937=    2939=    2940=
U 10A8           3042=    3043=    3046=    3047=    3059=    3060=    3064=    3065=
U 10B0           3070=    3076=    3082=    3083=    3094=    3095=    3116=    3117=
U 10B8           3120=    3121=    3122=    3123=    3128=    3135=    3136=    3137=
U 10C0           3140=    3141=    3146=    3153=    3154=    3155=    3158=    3159=
U 10C8           3164=    3165=    3210=    3211=    3212=    3219=    3220=    3221=
U 10D0           3228=    3229=    3230=    3231=    3232=    3233=    3235=    3242=
U 10D8           3243=    3244=    3247=    3248=    3249=    3250=    3251=    3252=
U 10E0           3254=    3262=    3263=    3264=    3265=    3266=    3267=    3268=
U 10E8           3276=    3277=    3278=    3279=    3280=    3281=    3283=    3284=
U 10F0           3290=    3291=    3346=    3347=    3349=    3350=    3360=    3361=
U 10F8           3362=    3363=    3364=    3365=    3366=    3367=    3369=    3376=
U 1100           1831:    1832:    1833:    1834:    1835:    1836:    1837:    1838:
U 1108           1839:    1873     3377=    3378=    1840:    1841:    1842:    1843:
U 1110           3379=    3380=    3381=    3382=    3383=    3384=    3385=    3386=
U 1118           3388=    3395=    3396=    3397=    3398=    3399=    3400=    3401=
U 1120           3402=    3403=    3404=    3405=    3407=    3414=    3415=    3416=
U 1128           3417=    3418=    3419=    3420=    3421=    3422=    3424=    3425=
U 1130           3427=    3433=    3435=    3436=    3437=    3438=    3439=    3440=
U 1138           3443=    3444=    3446=    3453=    3454=    3455=    3456=    3457=
U 1140           3458=    3459=    3462=    3463=    3465=    3471=    3473=    3474=
U 1148           3475=    3476=    3477=    3478=    3481=    3482=    3484=    3485=
U 1150           3525=    3526=    3528=    3535=    1874     1992:    3538=    3539=
U 1158           3540=    3541=    3542=    3543=    3549=    3557=    3561=    3562=
U 1160           3563=    3564=    3565=    3566=    3568=    3569=    3572=    3573=
U 1168           3580=    3581=    1875     1882     1883     1897     1898     1899
U 1170           1900     1901     1902     1903     1904     1905     1906     1907
U 1178           1908     1909     1910     1911     1912     1913     1914     1915
U 1180           1916     1917     1918     1919     1922     1923     1966     1967
U 1188           1968     1978     1979     1987     1988     1989     2008     2009
U 1190           2010     2011     2012     2014     2015     2016     2017     2019
U 1198           2020     2021     2022     2023     2047     2318     2319     2320
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0          2321    2322    2323    2324    2331    2332    2333    2334
U 11A8          2335    2339    2340    2344    2345    2349    2350    2432
U 11B0          2433    2438    2439    2440    2441    2442    2443    2446
U 11B8          2447    2448    2449    2450    2464    2465    2466    2467
U 11C0          2468    2469    2472    2473    2474    2475    2476    2492
U 11C8          2493    2494    2495    2500    2501    2502    2503    2504
U 11D0          2505    2508    2509    2512    2513    2514    2515    2516
U 11D8          2517    2534    2535    2536    2537    2538    2541    2542
U 11E0          2543    2559    2562    2563    2564    2572    2573    2574
U 11E8          2575    2576    2577    2578    2579    2582    2583    2584
U 11F0          2585    2588    2589    2590    2591    2594    2595    2596
U 11F8          2611    2612    2613    2614    2615    2616    2617    2618
U 1200          2052:   2053:   2054:   2055:   2056:   2057:   2058:   2059:
U 1208          2060:   2061:   2062:   2063:   2064:   2065:   2066:   2067:
U 1210          2068:   2069:   2070:   2071:   2072:   2073:   2074:   2075:
U 1218          2076:   2077:   2078:   2079:   2080:   2081:   2082:   2083:
U 1220          2084:   2085:   2086:   2087:   2088:   2089:   2090:   2091:
U 1228          2092:   2093:   2094:   2095:   2096:   2097:   2098:   2099:
U 1230          2100:   2101:   2102:   2103:   2104:   2105:   2106:   2107:
U 1238          2108:   2109:   2110:   2111:   2112:   2113:   2114:   2115:
U 1240          2116:   2117:   2118:   2119:   2120:   2121:   2122:   2123:
U 1248          2124:   2125:   2126:   2127:   2128:   2129:   2130:   2131:
U 1250          2132:   2133:   2134:   2135:   2136:   2137:   2138:   2139:
U 1258          2140:   2141:   2142:   2143:   2144:   2145:   2146:   2147:
U 1260          2148:   2149:   2150:   2151:   2152:   2153:   2154:   2155:
U 1268          2156:   2157:   2158:   2159:   2160:   2161:   2162:   2163:
U 1270          2164:   2165:   2166:   2167:   2168:   2169:   2170:   2171:
U 1278          2172:   2173:   2174:   2175:   2176:   2177:   2178:   2179:
U 1280          2180:   2181:   2182:   2183:   2184:   2185:   2186:   2187:
U 1288          2188:   2189:   2190:   2191:   2192:   2193:   2194:   2195:
U 1290          2196:   2197:   2198:   2199:   2200:   2201:   2202:   2203:
U 1298          2204:   2205:   2206:   2207:   2208:   2209:   2210:   2211:
U 12A0          2212:   2213:   2214:   2215:   2216:   2217:   2218:   2219:
U 12A8          2220:   2221:   2222:   2223:   2224:   2225:   2226:   2227:
U 12B0          2228:   2229:   2230:   2231:   2232:   2233:   2234:   2235:
U 12B8          2236:   2237:   2238:   2239:   2240:   2241:   2242:   2243:
U 12C0          2244:   2245:   2246:   2247:   2248:   2249:   2250:   2251:
U 12C8          2252:   2253:   2254:   2255:   2256:   2257:   2258:   2259:
U 12D0          2260:   2261:   2262:   2263:   2264:   2265:   2266:   2267:
U 12D8          2268:   2269:   2270:   2271:   2272:   2273:   2274:   2275:
U 12E0          2276:   2277:   2278:   2279:   2280:   2281:   2282:   2283:
U 12E8          2284:   2285:   2286:   2287:   2288:   2289:   2290:   2291:
U 12F0          2292:   2293:   2294:   2295:   2296:   2297:   2298:   2299:
U 12F8          2300:   2301:   2302:   2303:   2304:   2305:   2306:   2307:
U 1300          2619    2620    2621    2622    2623    2624    2627    2628
U 1308          2629    2632    2633    2634    2635    2636    2647    2652
U 1310          2653    2654    2655    2656    2659    2660    2661    2662
U 1318          2663    2664    2665    2666    2667    2668    2669    2670
U 1320          2671    2672    2674    2675    2676    2677    2680    2681
U 1328          2682    2683    2741    2742    2743    2744    2745    2746
U 1330          2747    2754    2757    2758    2761    2762    2763    2773
U 1338          2774    2775    2776    2784    2785    2788    2789    2790
U 1340          2791    2799    2800    2801    2802    2803    2806    2807
```

```
;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 1348           2808    2809    2810    2811    2812    2823    2826    2827
U 1350           2828    2831    2832    2833    2834    2835    2836    2837
U 1358           2838    2839    2851    2852    2853    2854    2857    2858
U 1360           2859    2862    2863    2864    2865    2866    2867    2868
U 1368           2871    2872    2873    2874    2875    2876    2909    2923
U 1370           2938    2941    2949    2958    2963    3044    3045    3048
U 1378           3049    3050    3051    3058    3061    3062    3063    3068
U 1380           3069    3077    3078    3079    3080    3081    3084    3085
U 1388           3086    3087    3088    3089    3090    3091    3092    3093
U 1390           3101    3102    3103    3104    3114    3115    3118    3119
U 1398           3126    3127    3138    3139    3144    3145    3156    3157
U 13A0           3162    3163    3166    3167    3168    3222    3223    3224
U 13A8           3225    3226    3227    3234    3245    3246    3253    3269
U 13B0           3270    3271    3273    3274    3275    3282    3285    3286
U 13B8           3287    3288    3289    3351    3352    3368    3387    3406
U 13C0           3423    3426    3434    3441    3442    3445    3460    3461
U 13C8           3464    3472    3479    3480    3483    3536    3537    3544
U 13D0           3545    3546    3547    3548    3558    3559    3560    3567
U 13D8           3570    3571    3574    3575    3576    3577    3578    3579
U 13E0           3590    3593
U 13E8 - 13EF Unused
U 13F0           1934:   1935:   1936:   1937:   1938:   1939:   1940:   1941:
U 13F8           1942:   1943:   1944:   1945:   1946:   1947:   1948:   1949:
```

```
          Words not
          in bounds
 ESK00DEF         0
 ESK00MAC         0
 ESKAHMAC         0
  ESKAH3B      1010

Used           1010
Remaining

Total microwords used in memory U: 1010
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH3B.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```

```
; 3     Control ROM Field Definitions
; 548   Register Transfer Macro Definitions
; 1413  Non-transfer Functions
; 1485  Branch Enable Macro Definitions
; 1564  MICRO DIAGNOSTIC DEFINED MACROS
; 2110  TEST 168         CES REGISTER BITS <11:0> DATA INTEGRITY FROM THE ID BUS
; 2211  TEST 169         CES REGISTER BITS <11,10,8,7> AND CONDITION CODE LOAD=1
; 2386  TEST 16A         CES REGISTER ALU N BIT
; 2588  TEST 16B         CES REGISTER BITS <15:12> (CS PARITY ERROR)
; 2690  TEST 16C         RECEIVER AND INTERVAL TIMER INTERRUPTS
; 2873  TEST 16D         CONSOLE INTERRUPT DISABLE
; 3041  TEST 16E         ID BUS 'ATEMP' REGISTERS
; 3200  TEST 16F         ID BUS 'BTEMP' REGISTERS
```

```
;1        .NOLIST
;1804     .LIST
;1805
```

```
                                        .REGION/1000,13FF

                                        ;+
                                        ; FOLLOWING ARE THE MICRO TRAP VECTOR ASSIGNMENTS. EACH VECTOR LOADS THE SC
                                        ; WITH A NUMBER, AND LOADS THE Q REGISTER WITH THE CONTENTS OF R[OF].
                                        ; R[OF] IS SETUP BY THE PROGRAM TO INDICATE WHETHER A MICRO TRAP IS EXPECTED
                                        ; THIS IS DONE BY SETTING THE BIT IN R[OF] THAT CORRESPONDS TO THE NUMBER
                                        ; THAT IS LOADED INTO THE SC BY THAT PARTICULAR MICRO TRAP.
                                        ;
                                        ; FOR EXAMPLE: IF A TEST EXPECTED A "TB MISS" MICRO TRAP IT WOULD SET BIT
                                        ;       6 IN SCRATCH PAD R[OF]. WHEN THE TRAP OCCURRED, THE TRAP CATCHER
                                        ;       ROUTINE WOULD SENSE THAT THE TRAP WAS EXPECTED AND CLEAR BIT 6 IN
                                        ;       R[OF] AND DO A RETURNO.
                                        ;
                                        ; IF THE BIT FOR THE PARTICULAR TRAP IS NOT SET IN R[OF], THE TRAP ROUTINE
                                        ; READS THE ERROR REGISTERS, SAVES THEM FOR TYPEOUT, AND MAKES AN ERROR CALL
                                        ; TO THE CONSOLE.
                                        ;
                                        ; THE JUMP FIELDS OF ALL THE TRAP VECTORS EXCEPT THE CONTROL STORE PARITY
                                        ; ERROR VECTOR, POINT TO A ROUTINE THAT EXECUTES A RETURNO IF THE TRAP WAS
                                        ; EXPECTED. THE CS PARITY ERROR VECTOR POINTS TO A ROUTINE THAT EXECUTES A
                                        ; RETURN1 IF THE TRAP WAS EXPECTED SINCE THE ADDRESS THAT WAS PUSHED ON THE
                                        ; STACK IS THE ADDRESS OF THE MICRO WORD WITH BAD PARITY.
                                        ;-

U 1100, 0000,003C,19C0,0A78,0084,7001   1100:   SC_K[ZERO],Q_R[OF],J/TRPHO      ; SYSTEM INIT
U 1101, 0000,003C,05C0,0A78,0084,7001   1101:   SC_K[.1],Q_R[OF],J/TRPHO        ; DATA UNALIGNED
U 1102, 0000,003C,09C0,0A78,0084,7001   1102:   SC_K[.2],Q_R[OF],J/TRPHO        ; X PAGE ERROR
U 1103, 0000,003C,0DC0,0A78,0084,7001   1103:   SC_K[.3],Q_R[OF],J/TRPHO        ; TB MODIFY
U 1104, 0000,003C,11C0,0A78,0084,7001   1104:   SC_K[.4],Q_R[OF],J/TRPHO        ; TB PROT ERROR
U 1105, 0000,003C,D5C0,0A78,0084,7001   1105:   SC_K[.6],Q_R[OF],J/TRPHO        ; TB MISS
U 1106, 0000,003C,D9C0,0A78,0084,7001   1106:   SC_K[.9],Q_R[OF],J/TRPHO        ; RES FLOAT OPER
U 1107, 0000,003C,5DC0,0A78,0084,7001   1107:   SC_K[.7],Q_R[OF],J/TRPHO        ; TB PARITY
U 1108, 0000,003C,01C0,0A78,0084,7001   1108:   SC_K[.8],Q_R[OF],J/TRPHO        ; CACHE PARITY
U 110C, 0000,003C,85C0,0A78,0084,7001   110C:   SC_K[.C],Q_R[OF],J/TRPHO        ; RDS
U 110D, 0000,003C,89C0,0A78,0084,7001   110D:   SC_K[.D],Q_R[OF],J/TRPHO        ; TIME OUT
U 110E, 0000,003C,65C0,0A78,0084,7001   110E:   SC_K[.10],Q_R[OF],J/TRPHO       ; ODD ADDRESS
U 110F, 0000,003C,61C0,0A78,0084,7138   110F:   SC_K[.F],Q_R[OF],J/TRPH2        ; CS PARITY

U 1001, 0001,2024,0180,0800,0010,105B   TRPHO:  ALU_Q.ANDNOT.MASK,CLK.UBCC      ; WAS TRAP EXPECTED?
U 105B, 0000,013C,0180,0800,0000,1002           Z?                              ; BRANCH IF NO
U 1002, 0001,2036,0180,0AF8,0000,0000   =0      ALU_Q[AND]MASK,R[OF]_ALU,RETURNO ; CLEAR THE BIT AND RETURN


                                        ;+
                                        ; THE FOLLOWING ROUTINE IS ENTERED WHEN A MICRO TRAP WAS NOT EXPECTED.
                                        ; IT PUTS THE CONTENTS OF THE ERROR REGISTERS INTO THE RC SCRATCH PADS
                                        ; FOR TYPEOUT. FOLLOWING IS THE FORMAT OF THE TYPEOUT:
                                        ;
                                        ;       DATA: TOP OF THE MICRO STACK(MICRO TRAP ADDRESS)
                                        ;             TRAP CODE--INDICATES WHICH TRAP OCCURRED
                                        ;             FAULT STATUS REGISTER
                                        ;             SBI ERROR REGISTER
                                        ;             TIMEOUT ADDRESS REGISTER
                                        ;             MAINTENANCE REGISTER
```

```
                                         ;1861    ;             CACHE PARITY REGISTER
                                         ;1862    ;             TB ERROR REGISTER 1
                                         ;1863    ;             TB ERROR REGISTER 0
                                         ;1864    ;-
                                         ;1865
U 1003, 0018,0038,1D80,09E8,0000,1004    ;1866    TRPH1:  RC[0D]_SC
U 1004, 0000,003D,D980,0800,0084,716B    ;1867    =0      SETRCF[.9]
U 1005, 0000,003C,49F0,2C00,0000,1083    ;1868            Q_ID[TBER0]
U 1083, 0001,203C,4DF0,2DB0,0000,1093    ;1869            RC[6]_Q,Q_ID[TBER1]
U 1093, 0001,203C,65F0,2DB8,0000,1109    ;1870            RC[7]_Q,Q_ID[SBI.ERR]
U 1109, 0001,203C,6DF0,2DD8,0000,1134    ;1871            RC[0B]_Q,Q_ID[FAULT]
U 1134, 0001,203C,75F0,2DE0,0000,1135    ;1872            RC[0C]_Q,Q_ID[MAINT]
U 1135, 0001,203C,79F0,2DC8,0000,1136    ;1873            RC[9]_Q,Q_ID[PARITY]
U 1136, 0001,203C,69F0,2DC0,0000,1137    ;1874            RC[8]_Q,Q_ID[TIME.ADDR]
U 1137, 0001,203C,81F0,2DD0,0000,1000    ;1875            RC[0A]_Q,Q_ID[USTACK]
U 1000, 0001,203D,0180,09F0,0000,114F    ;1876    1000:   RC[0E]_Q,ERROR1
                                         ;1877
                                         ;1878    ;+
                                         ;1879    ; THIS ROUTINE IS USED FOR CONTROL STORE PARITY ERROR MICRO TRAPS.
                                         ;1880    ;-
                                         ;1881
U 1138, 0001,2024,0180,0800,0010,1139    ;1882    TRPH2:  ALU_Q.ANDNOT.MASK,CLK.UBCC       ; WAS THE TRAP EXPECTED?
U 1139, 0000,013C,0180,0800,0000,1006    ;1883            Z?                               ; BRANCH IF NO
U 1006, 0001,2036,0180,0AF8,0000,0001    ;1884    =0      ALU_Q[AND]MASK,R[0F]_ALU,RETURN1 ; RETURN
U 1007, 0000,003C,0180,0800,0000,1003    ;1885            J/TRPH1                          ; REPORT UNEXPECTED TRAP
                                         ;1886
                                         ;1887
                                         ;1888    ;+
                                         ;1889    ; THESE ROUTINES ARE USED TO CALL THE CONSOLE WHEN THE
                                         ;1890    ; MICRO TEST EXECUTES ONE OF THE INSTRUCTIONS:
                                         ;1891    ;               NEWTST
                                         ;1892    ;               ERLOOP
                                         ;1893    ;               ERROR1
                                         ;1894    ;               ERROR2
                                         ;1895    ;
                                         ;1896
U 113A, 0000,003C,65F8,0800,0084,713B    ;1897    SCOPE:  SC_K[.10],Q_0                    ; SETUP TO WRITE IPL OF 1F
U 113B, 0818,0038,8D80,0800,0000,113C    ;1898            D_K[.1F]                         ; ...
U 113C, 0D00,003C,0180,0800,0000,113D    ;1899            D_DAL.SC
U 113D, 0000,003C,3D80,3C00,0000,113E    ;1900            ID[PSL]_D                        ; WRITE THE PSL
U 113E, 0818,0038,0580,0800,0000,113F    ;1901            D_K[.1]                          ; SETUP TO CLEAR THE CES REGISTER
U 113F, 0D00,003C,0180,0800,0000,1140    ;1902            D_DAL.SC
U 1140, 0F00,003C,3180,3C00,0000,1141    ;1903            ID[CES]_D,D_0                    ; CLEAR THE CES REGISTER
U 1141, 0000,003C,5D80,3C00,0000,1142    ;1904            ID[ACC.CS]_D                     ; SHUT OFF THE FLOATING POINT
U 1142, 0000,003C,3980,3C00,0000,1143    ;1905            ID[SIR]_D                        ; CLEAR THE SIR REGISTER
U 1143, 0000,003C,2980,3C00,0000,1144    ;1906            ID[CLK.CS]_D                     ; STOP INTERVAL TIMER
U 1144, 0000,003C,4980,3C00,0000,1145    ;1907            ID[TBER0]_D                      ; SHUT OFF THE TB
U 1145, 0000,003C,7180,3C00,0000,1146    ;1908            ID[COMP]_D                       ; CLEAR SILO COMPARATOR
U 1146, 0818,0038,C180,0800,0000,1147    ;1909            D_K[.FFFF]
U 1147, 0000,003C,6580,3C00,0000,1148    ;1910            ID[SBI.ERR]_D
U 1148, 0F00,003C,6D80,3C00,0000,1149    ;1911            ID[FAULT]_D,D_0
U 1149, 0000,003C,6D80,3C00,0000,114A    ;1912            ID[FAULT]_D
U 114A, 0000,003C,6580,3C00,0000,114B    ;1913            ID[SBI.ERR]_D
U 114B, 0003,003C,0180,09F0,0000,114C    ;1914            RC[0E]_0
U 114C, 0003,003C,0180,0AF8,0000,114D    ;1915            R[0F]_0
```

```
U 114D, 0003,003C,0180,09E8,0000,105E   ;1916           RC[0D]_0,J/CALLCON              ; CALL THE CONSOLE
U 114E, 0818,0038,0980,0800,0000,105E   ;1917   ERLOOP: D_K[.2],J/CALLCON               ; ERRLOOP CALL
U 114F, 0810,0038,0180,0978,0000,1150   ;1918   ERROR1: D_RC[0F]
U 1150, 0819,0034,4D80,0800,0000,104E   ;1919           D_D.AND.K[.FF00]
U 104E, 0819,0030,1180,0800,0000,105E   ;1920   104E:   D_D.OR.K[.4],J/CALLCON
                                        ;1921
U 1151, 0810,0038,0180,0978,0000,1152   ;1922   ERROR2: D_RC[0F]
U 1152, 0819,0034,4D80,0800,0000,105A   ;1923           D_D.AND.K[.FF00]
U 105A, 0819,0030,D580,0800,0000,105E   ;1924   105A:   D_D.OR.K[.6],J/CALLCON
                                        ;1925
                                        ;1926   105E:
                                        ;1927   CALLCON:
U 105E, 0000,003C,1D80,3C00,0000,105E   ;1928           ID[TXDB]_D,J/CALLCON            ; CALL THE CONSOLE
                                        ;1929
                                        ;1930   ;+
                                        ;1931   ; THESE ARE CS SCRATCH LOCATIONS USED BY THE CONSOLE MONITOR PROGRAM
                                        ;1932   ;-
                                        ;1933
U 13F0, 0000,003C,0180,0800,0000,13F1   ;1934   13F0:   NOP
U 13F1, 0000,003C,0180,0800,0000,13F2   ;1935   13F1:   NOP
U 13F2, 0000,003C,0180,0800,0000,13F3   ;1936   13F2:   NOP
U 13F3, 0000,003C,0180,0800,0000,13F4   ;1937   13F3:   NOP
U 13F4, 0000,003C,0180,0800,0000,13F5   ;1938   13F4:   NOP
U 13F5, 0000,003C,0180,0800,0000,13F6   ;1939   13F5:   NOP
U 13F6, 0000,003C,0180,0800,0000,13F7   ;1940   13F6:   NOP
U 13F7, 0000,003C,0180,0800,0000,13F8   ;1941   13F7:   NOP
U 13F8, 0000,003C,0180,0800,0000,13F9   ;1942   13F8:   NOP
U 13F9, 0000,003C,0180,0800,0000,13FA   ;1943   13F9:   NOP
U 13FA, 0000,003C,0180,0800,0000,13FB   ;1944   13FA:   NOP
U 13FB, 0000,003C,0180,0800,0000,13FC   ;1945   13FB:   NOP
U 13FC, 0000,003C,0180,0800,0000,13FD   ;1946   13FC:   NOP
U 13FD, 0000,003C,0180,0800,0000,13FE   ;1947   13FD:   NOP
U 13FE, 0000,003C,0180,0800,0000,13FF   ;1948   13FE:   NOP
U 13FF, 0000,003C,0180,0800,0000,1153   ;1949   13FF:   NOP
                                        ;1950
                                        ;1951
                                        ;1952   ;+
                                        ;1953   ; THESE SUBROUTINES ARE USED TO GENERATE CONSTANTS IN THE D REGISTER
                                        ;1954   ; THE D REGISTER IS SHIFTED LEFT BY 4 BITS AND THE APPROPRIATE CONSTANT
                                        ;1955   ; IS INSERTED INTO THE LOWER 4 BITS. THE CONSTANT THAT GETS INSERTED
                                        ;1956   ; IS DETERMINED BY THE ENTRY POINT INTO THE FOLLOWING 16 LOCATIONS.
                                        ;1957   ;
                                        ;1958   ; FOR EXAMPLE: IF A HEX "55" IS DESIRED IN THE LOW 8 BITS OF THE D REG THEN
                                        ;1959   ;       THE FOLLOWING CODE WOULD BE USED TO GET THAT CONSTANT
                                        ;1960   ;
                                        ;1961   ;               =0      D_0,CALL,J/DC5
                                        ;1962   ;                       NOP
                                        ;1963   ;               =0      CALL,J/DC5
                                        ;1964   ;-
                                        ;1965
U 1153, 0018,0038,1980,0800,0000,1164   ;1966   DC0:    ALU_0(K),J/S00
U 1154, 0018,0038,1980,0800,0000,1165   ;1967   DC1:    ALU_0(K),J/S01
U 1156, 0018,0038,1980,0800,0000,1166   ;1968   DC2:    ALU_0(K),J/S10
U 1157, 0018,0038,1980,0800,0000,1167   ;1969   DC3:    ALU_0(K),J/S11
U 1158, 0018,0038,0980,0800,0000,1164   ;1970   DC4:    ALU_K[.2],J/S00
```

```
U 1159, 0018,0038,0980,0800,0000,1165    ;1971    DC5:    ALU_K[.2],J/S01
U 115A, 0018,0038,0980,0800,0000,1166    ;1972    DC6:    ALU_K[.2],J/S10
U 115B, 0018,0038,0980,0800,0000,1167    ;1973    DC7:    ALU_K[.2],J/S11
U 115C, 0018,0038,0580,0800,0000,1164    ;1974    DC8:    ALU_K[.1],J/S00
U 115D, 0018,0038,0580,0800,0000,1165    ;1975    DC9:    ALU_K[.1],J/S01
U 115E, 0018,0038,0580,0800,0000,1166    ;1976    DCA:    ALU_K[.1],J/S10
U 115F, 0018,0038,0580,0800,0000,1167    ;1977    DCB:    ALU_K[.1],J/S11
U 1160, 0018,0038,C180,0800,0000,1164    ;1978    DCC:    ALU_K[.FFFF],J/S00
U 1161, 0018,0038,C180,0800,0000,1165    ;1979    DCD:    ALU_K[.FFFF],J/S01
U 1162, 0018,0038,C180,0800,0000,1166    ;1980    DCE:    ALU_K[.FFFF],J/S10
U 1163, 0018,0038,C180,0800,0000,1167    ;1981    DCF:    ALU_K[.FFFF],J/S11
                                         ;1982
U 1164, 0118,0038,1B80,0800,0000,1168    ;1983    S00:    ALU_O(K),D_D.LEFT2,SI/7,J/SX
U 1165, 0118,0038,0B80,0800,0000,1168    ;1984    S01:    ALU_K[.2],D_D.LEFT2,SI/7,J/SX
U 1166, 0118,0038,0780,0800,0000,1168    ;1985    S10:    ALU_K[.1],D_D.LEFT2,SI/7,J/SX
U 1167, 0118,0038,C380,0800,0000,1168    ;1986    S11:    ALU_K[.FFFF],D_D.LEFT2,SI/7,J/SX
                                         ;1987
U 1168, 0100,003E,0380,0800,0000,0001    ;1988    SX:     D_D.LEFT2,SI/7,RETURN1          ; EXIT
                                         ;1989
                                         ;1990
                                         ;1991    ;+
                                         ;1992    ; THIS SUBROUTINE IS USED TO INCREMENT THE SUBTEST NUMBER
                                         ;1993    ; THE SUBTEST NUMBER IS STORED IN BYTE 1 OF REGISTER RC[OF] AS A
                                         ;1994    ; TWO'S COMPLIMENT NUMBER. THE CONSOLE PROGRAM NEGATES THIS NUMBER BEFORE
                                         ;1995    ; TYPING IT.
                                         ;1996    ;-
                                         ;1997
U 1169, 0810,0038,4D80,0978,0000,116A    ;1998    SUBTST: D_RC[OF],KMX/.FF00
U 116A, 0019,4016,4D80,09F8,0000,0001    ;1999            RC[OF]_D+K[.FF00],WORD,RETURN1
                                         ;2000
                                         ;2001    ;+
                                         ;2002    ; THIS ROUTINE IS USED TO SET THE NUMBER OF DATA WORDS TO TYPE INTO THE
                                         ;2003    ; LOW BYTE OF RC[OF] WITHOUT CHANGING THE OTHER BYTES. IT MUST BE CALLED
                                         ;2004    ; WITH THE NUMBER TO PUT IN THE LOWER BYTE IN THE SC.
                                         ;2005    ;-
                                         ;2006
U 116B, 0010,0038,01C0,0978,0000,116C    ;2007    SETRCF: Q_RC[OF]
U 116C, 0019,2034,4DC0,0800,0000,116D    ;2008            Q_Q.AND.K[.FF00]
U 116D, 0019,2032,1D80,09F8,0000,0001    ;2009            RC[OF]_Q.OR.SC,RETURN1
                                         ;2010
```

```
                                    ;2011
U 1155, 0019,2000,05C0,0800,0000,12AB   ;2012   1155:   Q_Q-K[.1],J/12AB
U 1300, 0000,003C,0180,0800,0000,1301   ;2013   1300:   NOP                             ; USED TO WRITE BAD PARITY
U 1301, 0000,003E,0180,0800,0000,0001   ;2014   1301:   RETURN1                         ; RETURN FROM PARITY TRAP
U 12AA, 0000,003C,0180,0800,0000,116E   ;2015   12AA:   NOP                             ; ECO'D LOCATION
                                        ;2016
                                        ;2017   ;+
                                        ;2018   ; THE FOLLOWING ROUTINES ARE USES TO SET OR CLEAR BITS IN THE CONSOLE
                                        ;2019   ; REGISTERS. BYTE 0 OF THE D REGISTER MUST CONTAIN "C", BYTE ONE OF THE
                                        ;2020   ; D REGISTER MUST CONTAIN THE CONSOLE REGISTER ID, I.E. 0=TXCS, 2=RXCS,
                                        ;2021   ; AND 4=MCR, AND THE UPPER WORD OF THE D REGISTER MUST CONTAIN THE DATA
                                        ;2022   ; TO SET IN THE REGISTER.
                                        ;2023   ;
                                        ;2024   ; THE SUBROUTINES MUST BE CALLED WITH THE DATA TO LOAD INTO THE REGISTER
                                        ;2025   ; IN SCRATCH PAD R[0A].
                                        ;2026   ;
                                        ;2027   ; NOTE: ONLY BIT 15, 9 AND 8 OF THE MCR REGISTER CAN BE SET OR CLEARED.
                                        ;2028   ;       ONLY BIT 7 OF THE RXCS REGISTER CAN BE SET OR CLEARED.
                                        ;2029   ;       BIT 7 OF THE TXCS REGISTER IS ALWAYS SET WHILE THE MICRO CODE IS RUNNING.
                                        ;2030   ;-
                                        ;2031
U 116E, 0800,003C,D980,0A50,0084,716F   ;2032   SETMCR: D_R[0A],SC_K[.9]                ; INSERT BIT 9 INTO DATA
U 116F, 0001,001C,0180,0AD0,0000,1170   ;2033           R[0A]_D.ORNOT.MASK              ; ...
U 1170, 0818,0038,1180,0800,0000,1171   ;2034           D_K[.4]                         ; GET REGISTER ID
U 1171, 0000,003C,01F8,0800,0084,7172   ;2035           SC_K[.8],Q_0                    ; SETUP FOR SHIFT
U 1172, 0D00,003C,0180,0800,0000,1177   ;2036           D_DAL.SC,J7COMCON               ; SHIFT TO BYTE 1
                                        ;2037
U 1173, 0F00,003C,01F8,0800,0000,1177   ;2038   SETTXCS:D_0,J/COMCON,Q_0                ; SET REGISTER ID
U 1174, 0818,0038,0980,0800,0000,1175   ;2039   SETRXCS:D_K[.2]                         ; GET REGISTER ID
U 1175, 0000,003C,01F8,0800,0084,7176   ;2040           SC_K[.8],Q_0                    ; SETUP FOR SHIFT
U 1176, 0D00,003C,0180,0800,0000,1177   ;2041           D_DAL.SC,J7COMCON               ; PUT IN BYTE 1
                                        ;2042
U 1177, 0019,0030,8580,0AD8,0000,1178   ;2043   COMCON: R[0B]_D.OR.K[.C]                ; INSERT BYTE 0 AND SAVE
U 1178, 0800,003C,0180,0A50,0000,1179   ;2044           D_R[0A]                         ; GET DATA TO PUT IN CONSOLE REG
U 1179, 0000,003C,6580,0800,0084,717A   ;2045           SC_K[.10]                       ; SETUP FOR SHIFT
U 117A, 0D00,003C,0180,0A58,0000,117B   ;2046           D_DAL.SC,LAB_R[0B]              ; PUT IN UPPER WORD
U 117B, 081C,2030,0180,0800,0000,105E   ;2047           D_LA.OR.D,J/CALLCON             ; INSERT LOWER WORD AND CALL CONSOLE
                                        ;2048
                                        ;2049   ;+
                                        ;2050   ; THIS SUBROUTINE EXECUTE AN SBI UNJAM SEQUENCE
                                        ;2051   ;-
                                        ;2052
U 117C, 0F00,003C,0180,0800,0000,117D   ;2053   UNJAM:  D_0
U 117D, 0000,003C,7580,3C00,0000,117E   ;2054           ID[MAINT]_D                     ; RELOAD THE MAT REG
U 117E, 0F00,003C,0180,8000,0000,117F   ;2055           D_0,MCT/SBI.HOLD                ; ASSERT HOLD FOR 16 CYCLES
U 117F, 0019,0020,6180,8000,0010,1180   ;2056   UNJAM0: A[U_D[XOR]K[.F],CLK.UBCC,MCT/SBI.HOLD ; DONE YET?
U 1180, 0000,013C,0180,8000,0000,1008   ;2057           Z?,MCT/SBI.HOLD                 ; BRANCH IF YES
U 1008, 0819,0014,0580,8000,0000,117F   ;2058   =0      D_D+K[.1],MCT/SBI.HOLD,J/UNJAM0 ; CONTINUE HOLDING THE BUS
                                        ;2059
U 1009, 0F00,003C,0180,8800,0000,1181   ;2060           D_0,MCT/SBI.HOLD+UNJAM          ; ASSERT HOLD AND UNJAM FOR 16 CYCLES
U 1181, 0019,0020,6180,8800,0010,1182   ;2061   UNJAM1: A[U_D[XOR]K[.F],CLK.UBCC,MCT/SBI.HOLD+UNJAM ; DONE YET?
U 1182, 0000,013C,0180,8800,0000,100A   ;2062           Z?,MCT/SBI.HOLD+UNJAM           ; BRANCH IF YES
U 100A, 0819,0014,0580,8800,0000,1181   ;2063   =0      D_D+K[.1],MCT/SBI.HOLD+UNJAM,J/UNJAM1 ; CONTINUE UNJAM
                                        ;2064
U 100B, 0F00,003C,0180,8000,8000,1183   ;2065           D_0,MCT/SBI.HOLD,INTRPT.ACK     ; ASSERT HOLD FOR 16 CYCLES
```

```
U 1183, 0019,0020,6180,8000,0010,1184   ;2066   UNJAM2: ALU_D[XOR]K[.F],MCT/SBI.HOLD,CLK.UBCC ; DONE YET?
U 1184, 0000,013C,0180,8000,0000,100C   ;2067           Z?,MCT/SBI.HOLD                ; BRANCH IF YES
U 100C, 0819,0014,0580,8000,0000,1183   ;2068   =0      D_D+K[.1],MCT/SBI.HOLD,J/UNJAM2 ; CONTINUE HOLDING
                                        ;2069
U 100D, 0000,003C,8580,0800,0084,7185   ;2070           SC_K[.C]
U 1185, 0803,001C,0180,0800,4000,1186   ;2071           D_NOT.MASK,INTRPT.STROBE
U 1186, 0000,003E,7580,3C00,0000,0001   ;2072           ID[MAINT]_D,RETURN1            ; TURN OFF THE SBI
                                        ;2073
                                        ;2074
                                        ;2075   ;+
                                        ;2076   ; THIS ROUTINE STARTS THE INSTRUCTION BUFFER AND WAITS FOR THREE
                                        ;2077   ; CACHE REFERANCES TO BE GIVEN TO THE IB. THIS GUARANTEES THAT THE IB
                                        ;2078   ; IS COMPLETELY FULL OF DATA.
                                        ;2079   ;
                                        ;2080   ; BEFORE EXITING THE ROUTINE, THE INSTRUCTION BUFFER IS SHUT OFF.
                                        ;2081   ;-
                                        ;2082
U 1187, 3000,003C,0180,6000,0000,1188   ;2083   IBWAIT: LOAD.IB,IBC/START
U 1188, 0000,003C,0180,F800,0000,1189   ;2084           MCT/ALLOW.IB.READ
U 1189, 0000,003C,0180,F800,0000,118A   ;2085           MCT/ALLOW.IB.READ
U 118A, 0000,003C,0180,F800,0000,118B   ;2086           MCT/ALLOW.IB.READ
U 118B, 0000,003C,0180,F800,0000,118C   ;2087           MCT/ALLOW.IB.READ
U 118C, 0000,003C,0180,F800,0000,118D   ;2088           MCT/ALLOW.IB.READ
U 118D, 1000,003E,0180,F800,0000,0001   ;2089           MCT/ALLOW.IB.READ,IBC/STOP,RETURN1
                                        ;2090
                                        ;2091   ;
                                        ;2092   ; THE FOLLOWING ROUTINE IS USED TO INTERFACE TO THE PCS MICROCODE TO
                                        ;2093   ; WRITE THE WCS DATA REGISTER. SINCE THE INSTRUCTION FOLLOWING A WRITE
                                        ;2094   ; TO THE WCS DATA REGISTER CANNOT BE IN WCS, AND THE PCS INSTRUCTION
                                        ;2095   ; THAT WRITES THE WCS(ADDRESS 56D) PERFORMS A "RETURN18" THE ADDRESS
                                        ;2096   ; 57E IS PUSHED ON THE MICRO STACK BEFORE JUMPING TO LOCATION 540. SINCE
                                        ;2097   ; LOCATION 57E PERFORMS A "RETURN10", THE INSTRUCTION CALLING THIS ROUTINE
                                        ;2098   ; MUST BE CONSTRAINED WITH "0****".
                                        ;2099   ;
                                        ;2100   =0
                                        ;2101   WRITEWCS:
U 100E, 0F00,003D,0180,0800,0000,1159   ;2102           D_0,CALL[DC5]          ; GENERATE ADDRESS "57E"
U 100F, 0000,003C,0180,0800,0000,1010   ;2103           NOP
U 1010, 0000,003D,0180,0800,0000,115B   ;2104   =0      CALL[DC7]              ; ...
U 1011, 0000,003C,0180,0800,0000,1012   ;2105           NOP
U 1012, 0000,003D,0180,0800,0000,1162   ;2106   =0      CALL[DCE]              ; ...
                                        ;2107           ID[USTACK]_D,D_R[4],
U 1013, 0800,003C,8180,3E20,0000,0540   ;2108               J/0540             ; GO WRITE WCS
                                        ;2109
                                        .PAGE   "TEST 168       CES REGISTER BITS <11:0> DATA INTEGRITY FROM THE ID BUS"
                                        ;*********************************************************************
                                        ;++
                                        ; TEST  168     CES REGISTER BITS<11:0> DATA INTEGRITY FROM ID BUS
                                        ;
                                        ; TEST DESCRIPTION
                                        ;       THIS TEST FLOATS A ZERO AND A ONE THRU BITS <11:0> OF THE CES
                                        ;       REGISTER BY WRITING AND READING THE REGISTER ON THE ID BUS.
                                        ;       THE ARITHMETIC TRAP CODES (BITS<6:4>) ARE NOT TESTED AND WILL
                                        ;       ALWAYS APPEAR AS ZERO'S IN THE DATA TYPEOUT.
                                        ;
                                        ;       SUBTST 1 - FLOAT A ZERO THRU THE BITS
                                        ;       SUBTST 2 - FLOAT A 1 THRU THE BITS
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS THE ID BUS INTERFACE TO BITS <11:0> OF THE CES
                                        ;       REGISTER ON THE ICL MODULE.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED CES REGISTER
                                        ;             RECEIVED CES REGISTER
                                        ;             LOOP COUNT -- INDICATES WHICH BIT IS BEING TESTED, I.E.
                                        ;               C= BIT 0, B= BIT 1, A= BIT 2, ETC. ALTHOUGH THE ARITHMETIC
                                        ;               TRAP CODE BITS ARE NOT TESTED, THE LOOP COUNT INCLUDES
                                        ;               THESE BITS.
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       SUBTST 1 - SYNCA2--CES REGISTER IS LOADED WITH THE TEST PATTERN
                                        ;                  SYNCA3--CES REGISTER IS READ
                                        ;       SUBTST 2 - SYNCA4--CES REGISTER IS LOADED WITH THE TEST PATTERN
                                        ;                  SYNC15--CES REGISTER IS READ
                                        ;--
                                        ;*********************************************************************
                                        =0
U 1014, 0018,0039,0D80,09F8,0000,113A   T168:   NEWTST[.3]
U 1015, 0000,003C,0180,0800,0000,1016           NOP
U 1016, 0818,0039,6180,0800,0000,115C   =0      D_K[.F],CALL,J/DC8              ; GENERATE MASK FOR LOWER 12 BITS OF CES
U 1017, 0000,003C,0180,0800,0000,1018           NOP
U 1018, 0000,003D,0180,0800,0000,1163   =0      CALL,J/DCF                      ; ...
U 1019, 0001,003C,0180,0A80,0000,101A           R[0]_D                          ; SAVE IN R0
U 101A, 0000,003D,0180,0800,0000,117C   =0      CALL,J/UNJAM                    ; CLEAR ANY SBI INTERRUPTS

                                        ;/////////////////////////////////////////////////////////////////////
                                        ;+
                                        ; FIRST FLOAT A ZERO THRU THE REGISTER
                                        ;-

U 101B, 0818,0038,F180,0800,0000,118E   T168S1: D_K[.FFFC]                      ; GENERATE INITIAL PATTERN
U 118E, 0819,0014,0980,0A88,0000,118F           D_D+K[.2],R[1]_ALU              ; SAVE
U 118F, 0000,003C,0180,0A00,0000,1190           LAB_R[0]
U 1190, 001C,2034,0180,09F0,0000,101C           RC[0E]_D.AND.LA                 ; MASK AND SAVE AS EXPECTED DATA
U 101C, 0000,003D,0180,0800,0000,1169   =0      SUBTEST
U 101D, 0018,0038,8580,09E0,0000,101E           RC[0C]_K[.C]                    ; SET THE LOOP COUNT
U 101E, 0000,003D,0180,0800,0000,114E   =0      ERLOOP
U 101F, 0800,003C,0180,0A08,0000,1191   T168L2: D_R[1]                          ; GET THE PATTERN
```

```
U 1191, 0810,0038,3180,3D70,0000,1192     SYNCA2: ID[CES]_D,D_RC[0E]                 ; LOAD THE RECISTER
U 1192, 0000,003C,31F0,2E00,0000,1193     SYNCA3: Q_ID[CES],LAB_R[0]                 ; READ IT BACK
U 1193, 001C,0034,01C0,0A00,0000,1194             Q_Q.AND.R[0]                       ; MASK THE RECEIVED PATTERN
U 1194, 001D,2000,0180,0800,0010,1195             A[U_Q-D,CLK.UBCC                   ; CHECK
U 1195, 0000,013C,0180,0800,0000,1020             Z?
U 1020, 0001,203D,0180,09E8,0000,1151     =0      ERROR2,RC[0D]_Q                    ; BIT FAILED IN CES
U 1021, 0000,003C,01C0,0A08,0000,1196             Q_R[1]                             ; GET THE PATTERN
U 1196, 0000,003C,03A8,0800,0000,1197             Q_Q.LEFT,SI/MUL-                   ; GENERATE THE NEXT PATTERN
U 1197, 0001,203C,0180,0A88,0000,1198             R[1]_Q                             ; SAVE
U 1198, 0000,003C,0180,0A00,0000,1199             LAB_R[0]
U 1199, 001C,0034,0180,09F0,0000,119A             RC[0E]_Q.AND.LA                    ; MASK AND SAVE AS EXPECTED
U 119A, 0810,0038,0180,0960,0000,119B             D_RC[0C]
U 119B, 0019,8000,0580,09E0,0010,119C             RC[0C]_D-K[.1],CLK.UBCC,BYTE       ; CHECK THE LOOP COUNT
U 119C, 0000,013C,0180,0800,0000,1022             Z?
U 1022, 0000,003C,0180,0800,0000,101F     =0      J/T168L2                           ; CONTINUE

                                          ;//////////////////////////////////////////////////////////////////////
                                          ;+
                                          ; NOW FLOAT A ONE THRU THE REGISTER
                                          ;-

U 1023, 0018,0038,0580,09F0,0000,1024     T168S2: RC[0E]_K[.1]                       ; INITIALIZE EXPECTED DATA
U 1024, 0000,003D,0180,0800,0000,1169     =0      SUBTEST
U 1025, 0018,0038,0580,0A88,0000,119D             R[1]_K[.1]                         ; INITIALIZE TEST PATTERN
U 119D, 0018,0038,8580,09E0,0000,1026             RC[0C]_K[.C]                       ; SET THE LOOP COUNT
U 1026, 0000,003D,0180,0800,0000,114E     =0      ERLOOP
U 1027, 0800,003C,0180,0A08,0000,119E     T168L1: D_R[1]                             ; GET THE TEST PATTERN
U 119E, 0810,0038,3180,3D70,0000,119F     SYNCA4: ID[CES]_D,D_RC[0E]                 ; LOAD THE CES REGISTER
U 119F, 0000,003C,31F0,2E00,0000,11A0     SYNC15: Q_ID[CES],LAB_R[0]                 ; READ IT BACK
U 11A0, 001C,0034,01C0,0A00,0000,11A1             Q_Q.AND.R[0]                       ; MASK
U 11A1, 001D,2000,0180,0800,0010,11A2             A[U_Q-D,CLK.UBCC                   ; CHECK
U 11A2, 0000,013C,0180,0800,0000,1028             Z?
U 1028, 0001,203D,0180,09E8,0000,1151     =0      ERROR2,RC[0D]_Q                    ; BIT FAILED IN CES REGISTER
U 1029, 0800,003C,0180,0A08,0000,11A3             D_R[1]                             ; GET THE DATA PATTERN
U 11A3, 0500,003C,0180,0800,0000,11A4             D_D.LEFT                           ; GENERATE NEXT PATTERN
U 11A4, 0001,003C,0180,0A88,0000,11A5             R[1]_D                             ; SAVE
U 11A5, 081C,2034,0180,0A00,0000,11A6             D_D.AND.R[0]                       ; MASK PATTERN
U 11A6, 0001,003C,0180,09F0,0000,11A7             RC[0E]_D                           ; SAVE AS EXPECTED PATTERN
U 11A7, 0810,0038,0180,0960,0000,11A8             D_RC[0C]
U 11A8, 0019,8000,0580,09E0,0010,11A9             RC[0C]_D-K[.1],CLK.UBCC,BYTE       ; CHECK THE LOOP COUNT
U 11A9, 0000,013C,0180,0800,0000,102A             Z?
U 102A, 0000,003C,0180,0800,0000,1027     =0      J/T168L1                           ; CONTINUE
U 102B, 0000,003C,0180,0800,0000,102C             NOP
```

```
                                  .PAGE   "TEST 169       CES REGISTER BITS <11,10,8,7> AND CONDITION CODE LOAD=1"
                                  ;*************************************************************************
                                  ;++
                                  ; TEST  169     CES REGISTER BITS <11,10,8,7> AND CONDITION CODE LOAD =1
                                  ;
                                  ; TEST DESCRIPTION
                                  ;       THIS TEST CHECKS THAT BITS 11,10,8, AND 7 OF THE CES REGISTER
                                  ;       CAN BE SET AND CLEARED WHEN EXECUTING A CCL1 FUNCTION.
                                  ;
                                  ;       SUBTST 1 - CHECK THE ALU C BIT (BIT 7).
                                  ;       SUBTST 2 - CHECK THE ALU Z BIT (BIT 8).
                                  ;       SUBTST 3 - CHECK THE EALU Z BIT (BIT 10).
                                  ;       SUBTST 4 - CHECK THE EALU N BIT (BIT 11).
                                  ;
                                  ; LOGIC DESCRIPTION
                                  ;       THIS TEST CHECKS THE MULTIPLEXOR FOR BITS 11,10,8, AND 7 OF THE
                                  ;       CES REGISTER ON THE ICL MODULE.
                                  ;
                                  ; ERROR DESCRIPTION
                                  ;       DATA: EXPECTED CES REGISTER
                                  ;             RECEIVED CES REGISTER
                                  ;             LOOP COUNT - INDICATES WHETHER THE BIT SHOULD BE SET OR
                                  ;               CLEAR, I.E. 2= BIT SHOULD BE CLEAR, 1= BIT SHOULD BE SET
                                  ;
                                  ; SYNC POINT DESCRIPTION
                                  ;       SUBTST 1 - SYNC16--CLOCK THE ALU C BIT
                                  ;       SUBTST 2 - SYNC17--CLOCK THE ALU Z BIT
                                  ;       SUBTST 3 - SYNC18--CLOCK THE EALU Z BIT
                                  ;       SUBTST 4 - SYNC19--CLOCK THE EALU N BIT
                                  ;--
                                  ;***********************************************************************
                                  =0
U 102C, 0018,0039,0D80,09F8,0000,113A   T169:   NEWTST[.3]
U 102D, 0018,0038,4180,0A80,0000,102E           R[0]_K[.80]                     ; MASK FOR ALU C BIT
U 102E, 0000,003D,0180,0800,0000,117C   =0      CALL,J/UNJAM                    ; CLEAR ANY SBI INTERRUPTS
U 102F, 0003,003C,0180,0A88,0000,11AA           R[1]_0                          ; INIT Q DATA FOR ALU CARRY
U 11AA, 0018,0038,4180,0A90,0000,11AB           R[2]_K[.80]                     ; SET DATA TO INIT CES CARRY BIT
U 11AB, 0003,003C,0180,09F0,0000,1030           RC[0E]_0                        ; INIT EXPECTED DATA

                                  ;///////////////////////////////////////////;///////////////////////
                                  ;+
                                  ; FIRST CHECK THE ALU C BIT
                                  ;-

                                  =0
U 1030, 0000,003D,0180,0800,0000,1169   T169S1: SUBTEST
U 1031, 0018,0038,0980,09E0,0000,1032           RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 1032, 0000,003D,0180,0800,0000,114E   =0      ERLOOP
U 1033, 0000,003C,01C0,0A08,0000,11AC   T169L1: Q_R[1]                          ; GET DATA TO CREATE CARRY
U 11AC, 0800,003C,0180,0A10,0000,11AD           D_R[2]                          ; GET DATA TO INIT CES REGISTER
U 11AD, 0000,003C,3180,3C00,0000,11AE           ID[CES]_D                       ; INIT THE CES REGISTER
U 11AE, 0019,2014,0580,0800,0010,11AF   SYNC16: ALU_Q+K[.1],CLK.UBCC            ; EXECUTE THE TEST
U 11AF, 0810,0038,31F0,2D70,0000,11B0           Q_ID[CES],D_RC[0E]              ; READ THE CARRY BIT
U 11B0, 0019,2034,41C0,0800,0000,11B1           Q_Q.AND.K[.80]                  ; MASK THE CARRY BIT
U 11B1, 001D,2000,0180,0800,0010,11B2           ALU_Q-D,CLK.UBCC                ; CHECK
```

```
U 11B2, 0000,013C,0180,0800,0000,1034                    Z?
U 1034, 0001,203D,0180,09E8,0000,1151          =0        ERROR2,RC[OD]_Q                   ; CES ALU CARRY 31 BIT FAILED
U 1035, 0018,0038,4180,09F0,0000,11B3                    RC[OE]_K[.80]                     ; SET EXPECTED DATA
U 11B3, 0003,003C,0180,0A90,0000,11B4                    R[2]_0                            ; SET INITIAL DATA
U 11B4, 0818,0038,C180,0800,0000,11B5                    D_K[.FFFF]
U 11B5, 0802,403C,0180,0800,0000,11B6                    D_D.SXT[WORD]
U 11B6, 0001,003C,0180,0A88,0000,11B7                    R[1]_D                            ; SET DATA TO GENERATE CARRY
U 11B7, 0810,0038,0180,0960,0000,11B8                    D_RC[OC]
U 11B8, 0019,8000,0580,09E0,0010,11B9                    RC[OC]_D-K[.1],CLK.UBCC,BYTE      ; CHECK THE LOOP
U 11B9, 0000,013C,0180,0800,0000,1036                    Z?
U 1036, 0000,003C,0180,0800,0000,1033          =0        J/T169L1                          ; CONTINUE


                                               ;//////////////////////////////////////////////////////////////////////
                                               ;+
                                               ; NOW CHECK THE ALU=0 BIT
                                               ;-

U 1037, 0003,003C,0180,09F0,0000,1038          T169S2:   RC[OE]_0                          ; INIT EXPECTED DATA
U 1038, 0000,003D,0180,0800,0000,1169          =0        SUBTEST
U 1039, 0818,0038,4180,0800,0000,11BA                    D_K[.80]
U 11BA, 0500,003C,0180,0800,0000,11BB                    D_D.LEFT
U 11BB, 0001,003C,0180,0A80,0000,11BC                    R[0]_D                            ; SET MASK FOR ALU Z BIT
U 11BC, 0018,0038,0580,0A88,0000,11BD                    R[1]_K[.1]                        ; SET THE ALU DATA
U 11BD, 0001,003C,0180,0A90,0000,11BE                    R[2]_D                            ; SET THE INITIAL DATA
U 11BE, 0018,0038,0980,09E0,0000,103A                    RC[OC]_K[.2]                      ; SET THE LOOP COUNT
U 103A, 0000,003D,0180,0800,0000,114E          =0        ERLOOP
U 103B, 0000,003C,01C0,0A08,0000,11BF          T169L2:   Q_R[1]                            ; GET ALU DATA
U 11BF, 0800,003C,0180,0A10,0000,11C0                    D_R[2]
U 11C0, 0000,003C,3180,3C00,0000,11C1                    ID[CES]_D                         ; INIT THE Z BIT
U 11C1, 0001,203C,0180,0800,0010,11C2          SYNC17:   ALU_Q,C[K.UBCC                    ; EXECUTE THE TEST
U 11C2, 0810,0038,31F0,2D70,0000,11C3                    Q_ID[CES],D_RC[OE]                ; READ THE REGISTER
U 11C3, 001C,0034,01C0,0A00,0000,11C4                    Q_Q.AND.R[0]                      ; MASK
U 11C4, 001D,2000,0180,0800,0010,11C5                    A[U_Q-D,CLK.UBCC                  ; CHECK
U 11C5, 0000,013C,0180,0800,0000,103C                    Z?
U 103C, 0001,203D,0180,09E8,0000,1151          =0        ERROR2,RC[OD]_Q                   ; ALU Z BIT FAILED IN CES REG
U 103D, 0003,003C,0180,0A90,0000,11C6                    R[2]_0                            ; INIT THE INITIAL CES DATA
U 11C6, 0000,003C,0180,0A00,0000,11C7                    LAB_R[0]                          ; GET THE EXPECTED DATA
U 11C7, 0000,003C,0180,09F0,0000,11C8                    RC[OE]_LA
U 11C8, 0003,003C,0180,0A88,0000,11C9                    R[1]_0                            ; INIT THE ALU DATA
U 11C9, 0810,0038,0180,0960,0000,11CA                    D_RC[OC]
U 11CA, 0019,8000,0580,09E0,0010,11CB                    RC[OC]_D-K[.1],CLK.UBCC,BYTE      ; CHECK THE LOOP
U 11CB, 0000,013C,0180,0800,0000,103E                    Z?
U 103E, 0000,003C,0180,0800,0000,103B          =0        J/T169L2                          ; CONTINUE
U 103F, 0000,003C,0180,0800,0000,11CC                    NOP


                                               ;//////////////////////////////////////////////////////////////////////
                                               ;+
                                               ; NOW CHECK THE EALU Z BIT
                                               ;-

U 11CC, 0003,003C,0180,09F0,0000,1040          T169S3:   RC[OE]_0                          ; INIT EXPECTED DATA
U 1040, 0000,003D,0180,0800,0000,1169          =0        SUBTEST
U 1041, 0800,003C,0180,0A00,0000,11CD                    D_R[0]                            ; GET MASK FOR ALU Z BIT
```

```
U 11CD, 0100,003C,0180,0800,0000,11CE   ;2321           D_D.LEFT2                       ; GENERATE MASK FOR EALU Z BIT
U 11CE, 0001,003C,0180,0A80,0000,11CF   ;2322           R[0]_D                          ; SAVE
U 11CF, 0018,0038,0580,0A88,0000,11D0   ;2323           R[1]_K[.1]                      ; SET EALU DATA
U 11D0, 0001,003C,0180,0A90,0000,11D1   ;2324           R[2]_D                          ; SET THE INITIAL BIT VALUE
U 11D1, 0018,0038,0980,09E0,0000,1042   ;2325           RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 1042, 0000,003D,0180,0800,0000,114E   ;2326   =0      ERLOOP
U 1043, 0000,003C,0180,0A08,0082,11D2   ;2327   T169L3: SC_R[1]                         ; GET EALU DATA
U 11D2, 0800,003C,0180,0A10,0000,11D3   ;2328           D_R[2]                          ; SET INITIAL DATA
U 11D3, 0C00,003C,3180,3C00,0000,11D4   ;2329           ID[CES]_D
U 11D4, 0000,003C,0180,0800,0010,11D5   ;2330           EALU_SC,CLK.UBCC                ; EXECUTE THE TEST
U 11D5, 0810,0038,31F0,2D70,0000,11D6   ;2331           Q_ID[CES],D_RC[0E]              ; READ THE CES REGISTER
U 11D6, 001C,0034,01C0,0A00,0000,11D7   ;2332           Q_Q.AND.R[0]                    ; MASK
U 11D7, 001D,2000,0180,0800,0010,11D8   ;2333           ALU_Q-D,CLK.UBCC                ; CHECK
U 11D8, 0000,013C,0180,0800,0000,1044   ;2334           Z?
U 1044, 0001,203D,0180,09E8,0000,1151   ;2335   =0      ERROR2,RC[0D]_Q                 ; EALU Z BIT FAILED
U 1045, 0000,003C,0180,0A00,0000,11D9   ;2336           LAB_R[0]                        ; GET NEXT EXPECTED DATA
U 11D9, 0000,003C,0180,09F0,0000,11DA   ;2337           RC[0E]_LA
U 11DA, 0003,003C,0180,0A88,0000,11DB   ;2338           R[1]_0                          ; SET EALU DATA
U 11DB, 0003,003C,0180,0A90,0000,11DC   ;2339           R[2]_0                          ; SET INITIAL DATA
U 11DC, 0810,0038,0180,0960,0000,11DD   ;2340           D_RC[0C]
U 11DD, 0019,8000,0580,09E0,0010,11DE   ;2341           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
U 11DE, 0000,013C,0180,0800,0000,1046   ;2342           Z?
U 1046, 0000,003C,0180,0800,0000,1043   ;2343   =0      J/T169L3                        ; CONTINUE
                                        ;2344
                                        ;2345
                                        ;2346   ;////////////////////////////////////////////////////////////////////
                                        ;2347   ;+
                                        ;2348   ; NOW CHECK EALU 09 BIT
                                        ;2349   ;-
                                        ;2350
U 1047, 0003,003C,0180,09F0,0000,1048   ;2351   T169S4: RC[0E]_0                        ; SET THE INITIAL EXPECTED VALUE
U 1048, 0000,003D,0180,0800,0000,1169   ;2352   =0      SUBTEST
U 1049, 0800,003C,0180,0A00,0000,11DF   ;2353           D_R[0]                          ; GET MASK FOR EALU Z
U 11DF, 0500,003C,0180,0800,0000,11E0   ;2354           D_D.LEFT                        ; GEN MASK FOR EALU 09
U 11E0, 0001,003C,0180,0A80,0000,11E1   ;2355           R[0]_D
U 11E1, 0001,003C,0180,0A90,0000,11E2   ;2356           R[2]_D                          ; INIT INITIAL VALUE OF BIT 11
U 11E2, 0003,003C,0180,0A88,0000,11E3   ;2357           R[1]_0                          ; SET THE INITIAL EALU DATA
U 11E3, 0018,0038,0980,09E0,0000,104A   ;2358           RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 104A, 0000,003D,0180,0800,0000,114E   ;2359   =0      ERLOOP
U 104B, 0000,003C,0180,0A08,0082,11E4   ;2360   T169L4: SC_R[1]                         ; GET EALU DATA
U 11E4, 0800,003C,0180,0A10,0000,11E5   ;2361           D_R[2]
U 11E5, 0000,003C,3180,3C00,0000,11E6   ;2362           ID[CES]_D                       ; INIT THE EALU 09 BIT
U 11E6, 0000,003C,0180,0800,0010,11E7   ;2363           EALU_SC,CLK.UBCC                ; EXECUTE THE TEST
U 11E7, 0810,0038,31F0,2D70,0000,11E8   ;2364           Q_ID[CES],D_RC[0E]              ; READ THE CES REGISTER
U 11E8, 001C,0034,01C0,0A00,0000,11E9   ;2365           Q_Q.AND.R[0]                    ; MASK
U 11E9, 001D,2000,0180,0800,0010,11EA   ;2366           ALU_Q-D,CLK.UBCC                ; CHECK
U 11EA, 0000,013C,0180,0800,0000,104C   ;2367           Z?
U 104C, 0001,203D,0180,09E8,0000,1151   ;2368   =0      ERROR2,RC[0D]_Q                 ; EALU N BIT FAILED IN CES
U 104D, 0000,003C,0180,0A00,0000,11EB   ;2369           LAB_R[0]
U 11EB, 0000,003C,0180,09F0,0000,11EC   ;2370           RC[0E]_LA                       ; SET NEXT EXPECTED VALUE
U 11EC, 0818,0038,4180,0800,0000,11ED   ;2371           D_K[.80]
U 11ED, 0100,003C,0180,0800,0000,11EE   ;2372           D_D.LEFT2
U 11EE, 0001,003C,0180,0A88,0000,11EF   ;2373           R[1]_D                          ; GENERATE EALU DATA AND SAVE
U 11EF, 0003,003C,0180,0A90,0000,11F0   ;2374           R[2]_0
U 11F0, 0810,0038,0180,0960,0000,11F1   ;2375           D_RC[0C]
```

```
U 11F1, 0019,8000,0580,09E0,0010,11F2                   RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
U 11F2, 0000,013C,0180,0800,0000,1050                   Z?
U 1050, 0000,003C,0180,0800,0000,104B          =0       J/T169L4
U 1051, 0000,003C,0180,0800,0000,1052                   NOP


                                               ; FOLLOWING IS THE IB DATA FOR THE PC REGISTER INCREMENT TEST:
                                               ;% 48
                                               ;$ 9F90,8F90,C090

```

```
                                          .PAGE   "TEST 16A       CES REGISTER ALU N BIT"
                                          ;*********************************************************************
                                          ;++
                                          ; TEST  16A     CES REGISTER ALU N BIT
                                          ;
                                          ; TEST DESCRIPTION
                                          ;       THIS TEST CHECKS THE ALU N BIT IN THE CES REGISTER. THIS IS DONE
                                          ;       BY SELECTING THE ALU TO DO A+B AND A-B, AND F=B, WITH SPECIFIC
                                          ;       DATA PATTERNS ON THE AMX AND BMX TO CHECK THE LOGIC THAT GENERATES
                                          ;       THIS BIT.
                                          ;
                                          ;       SUBTST 1 - CHECK THE DATA PATTERNS THAT REQUIRE THE ALU TO
                                          ;                  BE EXECUTING AN A+B TO GET THE CORRECT ALU DATA.
                                          ;       SUBTST 2 - CHECK THE DATA PATTERNS THAT REQUIRE THE ALU TO
                                          ;                  BE EXECUTING AN A-B TO GET THE CORRECT ALU DATA.
                                          ;       SUBTST 3 - CHECK THE DATA PATTERNS THAT REQUIRE THE ALU TO
                                          ;                  BE EXECUTING ANYTHIN BUT AN A+B OR A-B.
                                          ;
                                          ; LOGIC DESCRIPTION
                                          ;       THIS TEST CHECKS THE LOGIC NETWORK ON THE CEH MODULE THAT GENERATES
                                          ;       THE ALU N BIT, AND THE MULTIPLEXOR ON THE ICL MODULE THAT FEEDS
                                          ;       THE ALU N BIT IN THE CES REGISTER.
                                          ;
                                          ; ERROR DESCRIPTION
                                          ;       DATA: EXPECTED CES REGISTER
                                          ;             RECEIVED CES REGISTER
                                          ;             LOOP COUNT - INDICATES WHICH DATA PATTERN IS BEING USED.
                                          ;               (SEE THE DATA AT THE END OF THE TEST)
                                          ;
                                          ; SYNC POINT DESCRIPTION
                                          ;       SUBTST 1 - SYNC1A--ALU N BIT GETS LOADED
                                          ;       SUBTST 2 - SYNC1B--ALU N BIT GETS LOADED
                                          ;       SUBTST 3 - SYNC1C--ALU N BIT GETS LOADED
                                          ;--
                                          ;*********************************************************************
                                          =0
U 1052, 0000,003D,0180,0800,0000,113A     T16A:   NEWTST
U 1053, 0018,0038,0D80,09F8,0000,11F3             RC[0F]_K[.3]
U 11F3, 0018,0038,6580,0A80,0000,1054             R[0]_K[.10]                     ; ADDRESS OF AMX DATA
U 1054, 0000,003D,0180,0800,0000,117C     =0      CALL,J/UNJAM                    ; CLEAR ANY SBI INTERRUPTS
U 1055, 0018,0038,7580,0A88,0000,11F4             R[1]_K[.20]                     ; ADDRESS OF BMX DATA
U 11F4, 0018,0038,7980,0A90,0000,11F5             R[2]_K[.30]                     ; ADDRESS OF EXPECTED ALU N BIT
U 11F5, 0818,0038,4180,0800,0000,11F6             D_K[.80]
U 11F6, 0100,003C,0180,0800,0000,11F7             D_D.LEFT2                       ; GENERATE MASK FOR N BIT
U 11F7, 0001,003C,0180,0A98,0000,11F8             R[3]_D                          ; SAVE

                                          ;/////////////////////////////////////////////////////////////////////
                                          ;+
                                          ; DO THOSE FUNCTIONS REQUIRING THE ALU TO DO AN A PLUS B
                                          ;-

U 11F8, 0018,0038,D580,09E0,0000,1056     T16AS1: RC[0C]_K[.6]                    ; SET THE LOP COUNT
U 1056, 0000,003D,0180,0800,0000,1169     =0      SUBTEST
U 1057, 0000,003C,0180,0A00,0200,11F9     T16AL1: VA_R[0]
U 11F9, 0000,803C,0180,C800,0000,11FA             D[BYTE]_CACHE.P                 ; FETCH AMX DATA
```

```
U 11FA, 0001,003C,0180,0AA8,0000,11FB   ;2441                  R[5]_D                          ; SAVE
U 11FB, 0000,003C,0180,0A08,0200,11FC   ;2442                  VA_R[1]
U 11FC, 0000,803C,0180,C800,0000,11FD   ;2443                  D[BYTE]_CACHE.P                 ; FETCH BMX DATA
U 11FD, 0001,003C,0180,09A8,0000,11FE   ;2444                  RC[5]_D                         ; SAVE
U 11FE, 0000,003C,0180,0A10,0200,11FF   ;2445                  VA_R[2]
U 11FF, 0000,403C,0180,C800,0000,1200   ;2446                  D[WORD]_CACHE.P                 ; FETCH EXPECTED N BIT DATA
U 1200, 0802,403C,0180,0800,0000,1201   ;2447                  D_D.SXT[WORD]
U 1201, 0001,003C,0180,09F0,0000,1058   ;2448                  RC[0E]_D                        ; SAVE
U 1058, 0000,003D,0180,0800,0000,114E   ;2449       =0         ERLOOP
U 1059, 0810,0038,0180,0970,0000,1202   ;2450                  D_RC[0E]
U 1202, 0801,0028,0180,0800,0000,1203   ;2451                  D_NOT.D                         ; GENERATE INITIAL VALUE OF N BIT
U 1203, 081C,2034,0180,0A18,0000,1204   ;2452                  D_D.AND.R[3]                    ; MASK
U 1204, 0810,0038,3180,3D70,0000,1205   ;2453                  ID[CES]_D,D_RC[0E]              ; INIT THE CES REGISTER
U 1205, 0000,003C,0180,0A28,0000,1206   ;2454                  LAB_R[5]
U 1206, 0000,003C,0180,0928,0000,1207   ;2455                  LC_RC[5]                        ; LATCH AMX AND BMX DATA
U 1207, 0010,8014,0180,0800,0010,1208   ;2456       SYNC1A:    ALU_LA+LC,CLK.UBCC,BYTE         ; EXECUTE THE TEST
U 1208, 0000,003C,31F0,2C00,0000,1209   ;2457                  Q_ID[CES]
U 1209, 001C,0034,01C0,0A18,0000,120A   ;2458                  Q_Q.AND.R[3]                    ; MASK
U 120A, 001D,2000,0180,0800,0010,120B   ;2459                  ALU_Q-D,CLK.UBCC                ; CHECK
U 120B, 0000,013C,0180,0800,0000,105C   ;2460                  Z?
U 105C, 0001,203D,0180,09E8,0000,1151   ;2461       =0         ERROR2,RC[0D]_Q                 ; ALU N BIT FAILED IN CES REG
U 105D, 0000,003C,0180,0A00,0000,120C   ;2462                  LAB_R[0]
U 120C, 0018,0014,0580,0A80,0000,120D   ;2463                  R[0]_LA+K[.1]                   ; INCREMENT ADR OF AMX DATA
U 120D, 0000,003C,0180,0A08,0000,120E   ;2464                  LAB_R[1]
U 120E, 0018,0014,0580,0A88,0000,120F   ;2465                  R[1]_LA+K[.1]                   ; INCREMENT ADR OF BMX DATA
U 120F, 0000,003C,0180,0A10,0000,1210   ;2466                  LAB_R[2]
U 1210, 0018,0014,0980,0A90,0000,1211   ;2467                  R[2]_LA+K[.2]                   ; INCREMENT ADR OF EXPECTED DATA
U 1211, 0810,0038,0180,0960,0000,1212   ;2468                  D_RC[0C]
U 1212, 0019,8000,0580,09E0,0010,1213   ;2469                  RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; CHECK THE LOOP COUNT
U 1213, 0000,013C,0180,0800,0000,1060   ;2470                  Z?
U 1060, 0000,003C,0180,0800,0000,1057   ;2471       =0         J/T16AL1                        ; CONTINUE
                                        ;2472
                                        ;2473
                                        ;2474       ;//////////////////////////////////////////////////////////////////////
                                        ;2475       ;+
                                        ;2476       ; NOW CHECK THOSE PATTERNS REQUIRING THE ALU TO DO AN A MINUS B
                                        ;2477       ;-
                                        ;2478
U 1061, 0018,0038,0980,09E0,0000,1062   ;2479       T16AS2:    RC[0C]_K[.2]                    ; SET THE LOOP COUNT
U 1062, 0000,003D,0180,0800,0000,1169   ;2480       =0         SUBTEST
U 1063, 0000,003C,0180,0A00,0200,1214   ;2481       T16AL2:    VA_R[0]
U 1214, 0000,803C,0180,C800,0000,1215   ;2482                  D[BYTE]_CACHE.P                 ; FETCH AMX DATA
U 1215, 0001,003C,0180,0AA8,0000,1216   ;2483                  R[5]_D                          ; SAVE
U 1216, 0000,003C,0180,0A08,0200,1217   ;2484                  VA_R[1]
U 1217, 0000,803C,0180,C800,0000,1218   ;2485                  D[BYTE]_CACHE.P                 ; FETCH BMX DATA
U 1218, 0001,003C,0180,09A8,0000,1219   ;2486                  RC[5]_D                         ; SAVE
U 1219, 0000,003C,0180,0A10,0200,121A   ;2487                  VA_R[2]
U 121A, 0000,403C,0180,C800,0000,121B   ;2488                  D[WORD]_CACHE.P                 ; FETCH EXPECTED N BIT DATA
U 121B, 0802,403C,0180,0800,0000,121C   ;2489                  D_D.SXT[WORD]
U 121C, 0001,003C,0180,09F0,0000,1064   ;2490                  RC[0E]_D                        ; SAVE
U 1064, 0000,003D,0180,0800,0000,114E   ;2491       =0         ERLOOP
U 1065, 0810,0038,0180,0970,0000,121D   ;2492                  D_RC[0E]
U 121D, 0801,0028,0180,0800,0000,121E   ;2493                  D_NOT.D                         ; GENERATE INITIAL VALUE OF N BIT
U 121E, 081C,2034,0180,0A18,0000,121F   ;2494                  D_D.AND.R[3]                    ; MASK
U 121F, 0810,0038,3180,3D70,0000,1220   ;2495                  ID[CES]_D,D_RC[0E]              ; INIT THE CES REGISTER
```

```
U 1220, 0000,003C,0180,0A28,0000,1221   ;2496              LAB_R[5]
U 1221, 0000,003C,0180,0928,0000,1222   ;2497              LC_RC[5]                           ; LATCH AMX AND BMX DATA
U 1222, 0010,8000,0180,0800,0010,1223   ;2498     SYNC1B:  ALU_LA-LC,CLK.UBCC,BYTE            ; EXECUTE THE TEST
U 1223, 0000,003C,31F0,2C00,0000,1224   ;2499              Q_ID[CES]
U 1224, 001C,0034,01C0,0A18,0000,1225   ;2500              Q_Q.AND.R[3]                       ; MASK
U 1225, 001D,2000,0180,0800,0010,1226   ;2501              ALU_Q-D,CLK.UBCC                   ; CHECK
U 1226, 0000,013C,0180,0800,0000,1066   ;2502              Z?
U 1066, 0001,203D,0180,09E8,0000,1151   ;2503     =0       ERROR2,RC[0D]_Q                    ; ALU N BIT FAILED IN CES REG
U 1067, 0000,003C,0180,0A00,0000,1227   ;2504              LAB_R[0]
U 1227, 0018,0014,0580,0A80,0000,1228   ;2505              R[0]_LA+K[.1]                      ; INCREMENT ADR OF AMX DATA
U 1228, 0000,003C,0180,0A08,0000,1229   ;2506              LAB_R[1]
U 1229, 0018,0014,0580,0A88,0000,122A   ;2507              R[1]_LA+K[.1]                      ; INCREMENT ADR OF BMX DATA
U 122A, 0000,003C,0180,0A10,0000,122B   ;2508              LAB_R[2]
U 122B, 0018,0014,0980,0A90,0000,122C   ;2509              R[2]_LA+K[.2]                      ; INCREMENT ADR OF EXPECTED DATA
U 122C, 0810,0038,0180,0960,0000,122D   ;2510              D_RC[0C]
U 122D, 0019,8000,0580,09E0,0010,122E   ;2511              RC[0C]_D-K[.1],CLK.UBCC,BYTE       ; CHECK THE LOOP COUNT
U 122E, 0000,013C,0180,0800,0000,1068   ;2512              Z?
U 1068, 0000,003C,0180,0800,0000,1063   ;2513     =0       J/T16AL2                           ; CONTINUE
                                        ;2514
                                        ;2515
                                        ;2516     ;//////////////////////////////////////////////////////////////////////
                                        ;2517     ;+
                                        ;2518     ; NOW CHECK THOSE PATTERNS REQUIRING THE ALU TO DO AN F=B
                                        ;2519     ;-
                                        ;2520
U 1069, 0018,0038,0980,09E0,0000,106A   ;2521     T16AS3:  RC[0C]_K[.2]                       ; SET THE LOOP COUNT
U 106A, 0000,003D,0180,0800,0000,1169   ;2522     =0       SUBTEST
U 106B, 0000,003C,0180,0A00,0200,122F   ;2523     T16AL3:  VA_R[0]
U 122F, 0000,803C,0180,C800,0000,1230   ;2524              D[BYTE]_CACHE.P                    ; FETCH AMX DATA
U 1230, 0001,003C,0180,0AA8,0000,1231   ;2525              R[5]_D                             ; SAVE
U 1231, 0000,003C,0180,0A08,0200,1232   ;2526              VA_R[1]
U 1232, 0000,803C,0180,C800,0000,1233   ;2527              D[BYTE]_CACHE.P                    ; FETCH BMX DATA
U 1233, 0001,003C,0180,09A8,0000,1234   ;2528              RC[5]_D                            ; SAVE
U 1234, 0000,003C,0180,0A10,0200,1235   ;2529              VA_R[2]
U 1235, 0000,403C,0180,C800,0000,1236   ;2530              D[WORD]_CACHE.P                    ; FETCH EXPECTED N BIT DATA
U 1236, 0802,403C,0180,0800,0000,1237   ;2531              D_D.SXT[WORD]
U 1237, 0001,003C,0180,09F0,0000,106C   ;2532              RC[0E]_D                           ; SAVE
U 106C, 0000,003D,0180,0800,0000,114E   ;2533     =0       ERLOOP
U 106D, 0810,0038,0180,0970,0000,1238   ;2534              D_RC[0E]
U 1238, 0801,0028,0180,0800,0000,1239   ;2535              D_NOT.D                            ; GENERATE INITIAL VALUE OF N BIT
U 1239, 081C,2034,0180,0A18,0000,123A   ;2536              D_D.AND.R[3]                       ; MASK
U 123A, 0810,0038,3180,3D70,0000,123B   ;2537              ID[CES]_D,D_RC[0E]                 ; INIT THE CES REGISTER
U 123B, 0000,003C,0180,0A28,0000,123C   ;2538              LAB_R[5]
U 123C, 0000,003C,0180,0928,0000,123D   ;2539              LC_RC[5]                           ; LATCH AMX AND BMX DATA
U 123D, 0010,8038,0180,0800,0010,123E   ;2540     SYNC1C:  ALU_LC,CLK.UBCC,BYTE,AMX/LA        ; EXECUTE THE TEST
U 123E, 0000,003C,31F0,2C00,0000,123F   ;2541              Q_ID[CES]
U 123F, 001C,0034,01C0,0A18,0000,1240   ;2542              Q_Q.AND.R[3]                       ; MASK
U 1240, 001D,2000,0180,0800,0010,1241   ;2543              ALU_Q-D,CLK.UBCC                   ; CHECK
U 1241, 0000,013C,0180,0800,0000,106E   ;2544              Z?
U 106E, 0001,203D,0180,09E8,0000,1151   ;2545     =0       ERROR2,RC[0D]_Q                    ; ALU N BIT FAILED IN CES REG
U 106F, 0000,003C,0180,0A00,0000,1242   ;2546              LAB_R[0]
U 1242, 0018,0014,0580,0A80,0000,1243   ;2547              R[0]_LA+K[.1]                      ; INCREMENT ADR OF AMX DATA
U 1243, 0000,003C,0180,0A08,0000,1244   ;2548              LAB_R[1]
U 1244, 0018,0014,0580,0A88,0000,1245   ;2549              R[1]_LA+K[.1]                      ; INCREMENT ADR OF BMX DATA
U 1245, 0000,003C,0180,0A10,0000,1246   ;2550              LAB_R[2]
```

```
U 1246, 0018,0014,0980,0A90,0000,1247              R[2]_LA+K[.2]                    ; INCREMENT ADR OF EXPECTED DATA
U 1247, 0810,0038,0180,0960,0000,1248              D_RC[0C]
U 1248, 0019,8000,0580,09E0,0010,1249              RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; CHECK THE LOOP COUNT
U 1249, 0000,013C,0180,0800,0000,1070              Z?
U 1070, 0000,003C,0180,0800,0000,106B      =0      J/T16AL3                         ; CONTINUE
U 1071, 0000,003C,0180,0800,0000,1072              NOP

                                           ; FOLLOWING IS THE AMX DATA FOR THE ABOVE TEST:
                                           ;% 10
                                           ; SUBTST 1 - USES ONE BYTE EACH TIME THRU THE LOOP
                                           ;$ 0080,4080,C040
                                           ; SUBTST 2 - USES ONE BYTE EACH TIME THRU THE LOOP
                                           ;$ 0000
                                           ; SUBTST 3 - USES ONE BYTE EACH TIME THRU THE LOOP
                                           ;$ 8000
                                           ;
                                           ; FOLLOWING IS THE BMX DATA FOR THE ABOVE TEST:
                                           ;% 20
                                           ; SUBTST 1 - USES ONE BYTE EACH TIME THRU THE LOOP
                                           ;$ 8000,4080,40C0
                                           ; SUBTST 2 - USES ONE BYTE EACH TIME THRU THE LOOP
                                           ;$ 8001
                                           ; SUBTST 3 - USES ONE BYTE EACH TIME THRU THE LOOP
                                           ;$ 0080
                                           ;
                                           ; FOLLOWING IS THE EXPECTED N DATA FOR THE ABOVE TEST:
                                           ;% 30
                                           ; SUBTST 1 - USES ONE WORD EACH TIME THRU THE LOOP
                                           ;$ 200,200,200,0000,0000,0000
                                           ; SUBTST 2 - USES ONE WORD EACH TIME THRU THE LOOP
                                           ;$ 200,0000
                                           ; SUBTST 3 - USES ONE WORD EACH TIME THRU THE LOOP
                                           ;$ 200,0000
```

```
                                                .PAGE   "TEST 16B       CES REGISTER BITS <15:12> (CS PARITY ERROR)"
                                                ;**********************************************************************
                                                ;++
                                                ; TEST  16B     CES REGISTER BITS <15:12> (CS PARITY ERROR)
                                                ;
                                                ; TEST DESCRIPTION
                                                ;       THIS TEST CHECKS BITS <15:12> OF THE CES REGISTER. THIS IS DONE BY
                                                ;       WRITING BAD PARITY IN A WCS LOCATION, EXECUTING THE LOCATION, AND
                                                ;       CHECKING THAT THE CORRECT BITS SET IN THE CES REGISTER. THE BITS
                                                ;       <14:12> ARE CHECKED ONE AT A TIME.
                                                ;
                                                ; LOGIC DESCRIPTION
                                                ;       THIS TEST CHECKS THE CS PARITY ERROR LATCHES AND THEIR INTERFACE
                                                ;       TO THE ID BUS, ON THE ICL MODULE.
                                                ;
                                                ; ERROR DESCRIPTION
                                                ;       DATA: EXPECTED CES REGISTER
                                                ;             RECEIVED CES REGISTER
                                                ;             LOOP COUNT - INIDCATES WHICH 32 BIT GROUP OF WCS SHOULD
                                                ;               CONTAIN BAD PARITY, I.E. 3= GROUP 0, 2= GROUP 1, ETC.
                                                ;
                                                ; SYNC POINT DESCRIPTION
                                                ;       ADDRESS 1300 - PCS PARITY ERROR SHOULD BE ASSERTED
                                                ;       ADDRESS SYNC1D--CES REGISTER IS READ
                                                ;--
                                                ;**********************************************************************
                                                =0
U 1072, 0000,003D,0180,0800,0000,113A           T16B:   NEWTST
U 1073, 0018,0038,0D80,09F8,0000,1074                   RC[0F]_K[.3]
U 1074, 0818,0039,0580,0800,0000,1157           =0      D_K[.1],CALL,J/DC3              ; GENERATE ADDRESS OF LOCATION
U 1075, 0000,003C,0180,0800,0000,1076                   NOP
U 1076, 0000,003D,0180,0800,0000,1153           =0      CALL,J/DC0                      ; ...
U 1077, 0000,003C,0180,0800,0000,1078                   NOP
U 1078, 0000,003D,0180,0800,0000,1153           =0      CALL,J/DC0
U 1079, 0001,003C,0180,0A80,0000,124A                   R[0]_D                          ; SAVE THIS ADDRESS IN R0 = 1300
U 124A, 0019,0030,4580,0A98,0000,107A                   R[3]_D.OR.K[.8000]              ; SAVE ADDRESS PLUS PARITY INVERT BIT IN R3
U 107A, 0000,003D,0180,0800,0000,117C           =0      CALL,J/UNJAM                    ; CLEAR ANY SBI INTERRUPTS
U 107B, 0000,003C,01F8,0800,0084,724B                   SC_K[.8],Q_0
U 124B, 0818,0038,CD80,0800,0000,124C                   D_K[.F0]                        ; GENERATE MASK FOR CES REGISTER
U 124C, 0D00,003C,0180,0800,0000,124D                   D_DAL.SC
U 124D, 0001,003C,0180,0A88,0000,107C                   R[1]_D                          ; SAVE IN R1
U 107C, 0818,0039,0980,0800,0000,1161           =0      D_K[.2],CALL[DCD]               ; GENERATE PROCESSOR REGISTER NUMBER
U 107D, 0001,003C,0180,0AA0,0000,124E                   R[4]_D                          ; FOR CALL TO PCS
U 124E, 0818,0038,7580,0800,0000,124F                   D_K[.20]                        ; GENERATE THE INCREMENT VALUE
U 124F, 0D00,003C,0180,0800,0000,1250                   D_DAL.SC                        ; FOR THE WCS GROUP SELECT
U 1250, 0001,003C,0180,0A90,0000,107E                   R[2]_D                          ; SAVE IN R2
U 107E, 0818,0039,D980,0800,0000,1153           =0      D_K[.9],CALL,J/DC0              ; GENERATE THE INITIAL EXPECTED
U 107F, 0D00,003C,0180,0800,0000,1251                   D_DAL.SC                        ; VALUE OF THE CES REGISTER
U 1251, 0001,003C,0180,09F0,0000,1252                   RC[0E]_D                        ; SAVE FOR TYPEOUT
U 1252, 0001,003C,0180,09D0,0000,1253                   RC[0A]_D                        ; SAVE FOR GENERATION OF NEXT VALUE

                                                ;//////////////////////////////////////////////////////////////////////
                                                ;+
                                                ; NOW CHECK EACH GROUP FOR THE CORRECT PARITY ERROR INDICATION IN THE CES REGISTER
                                                ;-
```

```
                                      ;2643
U 1253, 0018,0038,0D80,09E0,0000,1254 ;2644          RC[0C]_K[.3]                     ; SET THE LOOP COUNT
U 1254, 0800,003C,0180,0A00,0000,104F ;2645  T16BL1: D_R[0]                           ; GET ADDRESS TO WRITE TO
U 104F, 0000,003D,8980,3C00,0000,100E ;2646  =0****  ID[WCS.ADDR]_D,CALL[WRITEWCS]    ; WRITE WCS WITH GOOD PARITY
U 105F, 0000,003C,0180,0800,0000,1080 ;2647          NOP
U 1080, 0000,003D,0180,0800,0000,100E ;2648  =0****  CALL[WRITEWCS]                   ; WRITE WCS
U 1090, 0000,003C,0180,0800,0000,1081 ;2649          NOP
U 1081, 0000,003D,0180,0800,0000,100E ;2650  =0****  CALL[WRITEWCS]                   ; WRITE THE THIRD 32 BITS
U 1091, 0800,003C,0180,0A18,0000,1082 ;2651          D_R[3]
U 1082, 0000,003D,8980,3C00,0000,100E ;2652  =0****  ID[WCS.ADDR]_D,CALL[WRITEWCS]    ; WRITE BAD PARITY IN ONE BANK
U 1092, 0000,003C,0180,0800,0000,1084 ;2653          NOP
U 1084, 0000,003D,0180,0800,0000,114E ;2654  =0      ERLOOP
U 1085, 0000,003C,0180,0950,0000,1255 ;2655          LC_RC[0A]                        ; GET EXPECTED VALUE OF CES
U 1255, 0010,0038,0180,09F0,0000,1256 ;2656          RC[0E]_LC                        ; SAVE FOR TYPEOUT
U 1256, 0018,0038,4580,0AF8,0000,1257 ;2657          R[0F]_K[.8000]                   ; SET TRAP EXPECTED FLAG
U 1257, 0818,0038,4580,0800,0000,1258 ;2658          D_K[.8000]
U 1258, 0000,003C,3180,3C00,0000,1086 ;2659          ID[CES]_D                        ; CLEAR THE CES FIRST
U 1086, 0000,003D,0180,0800,0000,1300 ;2660  =0      CALL,J/T300                      ; GO EXECUTE THE PARITY ERROR
U 1087, 0810,0038,31F0,2D70,0000,1259 ;2661  SYNCID: Q_ID[CES],D_RC[0E]               ; READ THE CES REGISTER
U 1259, 001C,0034,01C0,0A08,0000,125A ;2662          Q_Q.AND.R[1]                     ; MASK
U 125A, 001D,2000,0180,0800,0010,125B ;2663          A[U_Q-D,CLK.UBCC                 ; CHECK
U 125B, 0000,013C,0180,0800,0000,1088 ;2664          Z?
U 1088, 0001,203D,0180,09E8,0000,1151 ;2665  =0      ERROR2,RC[0D]_Q                  ; CES REGISTER FAILED PARITY BITS
U 1089, 0818,0038,4580,0800,0000,125C ;2666          D_K[.8000]                       ; GET DATA TO CLEAR CES PARITY BITS
U 125C, 0000,003C,3180,3C00,0000,125D ;2667          ID[CES]_D                        ; CLEAR THE CES PARITY BITS
U 125D, 0F00,003C,31F0,2C00,0000,125E ;2668          Q_ID[CES],D_0                    ; READ THEM BACK
U 125E, 0003,003C,0180,09F0,0000,125F ;2669          RC[0E]_0                         ; SET EXPECTED VALUE FOR TYPEOUT
U 125F, 001C,0034,01C0,0A08,0000,1260 ;2670          Q_Q.AND.R[1]                     ; MASK
U 1260, 001D,2000,0180,0800,0010,1261 ;2671          A[U_Q-D,CLK.UBCC                 ; CHECK
U 1261, 0000,013C,0180,0800,0000,108A ;2672          Z?
U 108A, 0001,203D,0180,09E8,0000,1151 ;2673  =0      ERROR2,RC[0D]_Q                  ; PARITY BITS IN CES DID NOT CLEAR
U 108B, 0800,003C,0180,0A18,0000,1262 ;2674          D_R[3]                           ; INCREMENT THE WCS GROUP ADDRESS
U 1262, 0000,003C,0180,0A10,0000,1263 ;2675          LAB_R[2]                         ; TO WRITE THE BAD PARITY INTO
U 1263, 001C,2014,0180,0A98,0000,1264 ;2676          R[3]_LA+D                        ; ...
U 1264, 0810,0038,0180,0950,0000,1265 ;2677          D_RC[0A]                         ; GET THE CURRENT EXPECTED CES DATA
U 1265, 0500,003C,0180,0800,0000,1266 ;2678          D_D.LEFT                         ; GENERATE NEXT EXPECTED DATA
U 1266, 0819,0030,4580,0800,0000,1267 ;2679          D_D.OR.K[.8000]                  ; INSERT PE SUM BIT
U 1267, 081C,2034,0180,0A08,0000,1268 ;2680          D_D.AND.R[1]                     ; MASK
U 1268, 0C01,003C,0180,09D0,0000,1269 ;2681          RC[0A]_D                         ; SAVE NEW EXPECTED CES DATA
U 1269, 0810,0038,0180,0960,0000,126A ;2682          D_RC[0C]
U 126A, 0019,8000,0580,09E0,0010,126B ;2683          RC[0C]_D-K[.1],CLK.UBCC,BYTE     ; DECREMENT THE LOOP COUNT
U 126B, 0000,013C,0180,0800,0000,108C ;2684          Z?
U 108C, 0000,003C,0180,0800,0000,1254 ;2685  =0      J/T16BL1                         ; CONTINUE
U 108D, 0000,003C,0180,0800,0000,108E ;2686          NOP
                                      ;2687
                                      ;2688
                                      ;2689
```

```
                                         ;2690    .PAGE   "TEST 16C       RECEIVER AND INTERVAL TIMER INTERRUPTS"
                                         ;2691    ;**********************************************************************
                                         ;2692    ;++
                                         ;2693    ;
                                         ;2694    ; TEST  16C     RECEIVER AND INTERVAL TIMER INTERRUPTS
                                         ;2695    ;
                                         ;2696    ; TEST DESCRIPTION
                                         ;2697    ;       THIS TEST CHECKS THAT THE RECEIVER INTERRUPT AND THE INTERVAL
                                         ;2698    ;       TIMER INTERRUPT GENERATE THE CORRECT IPL ACTIVE LEVELS AND
                                         ;2699    ;       THE CORRECT VECTOR.
                                         ;2700    ;
                                         ;2701    ;       SUBTST 1 - CHECK THE RECEIVER INTERRUPT
                                         ;2702    ;       SUBTST 2 - CHECK THE INTERVAL TIMER INTERRUPT
                                         ;2703    ;
                                         ;2704    ; LOGIC DESCRIPTION
                                         ;2705    ;       THIS TEST CHECKS PART OF THE MULTIPLEXORS THAT GENERATE THE IPL
                                         ;2706    ;       ACTIVE BITS AND PART OF THE PRIORITY ENCODERS FOR THE IPL ACTIVE
                                         ;2707    ;       BITS AND PART OF THE VECTOR ROM ON THE ICL MODULE.
                                         ;2708    ;
                                         ;2709    ; ERROR DESCRIPTION
                                         ;2710    ;       DATA: EXPECTED IPL LEVEL OR VECTOR
                                         ;2711    ;             RECEIVED IPL LEVEL OR VECTOR
                                         ;2712    ;             ERROR TYPE FLAG -- 0=IPL ACTIVE
                                         ;2713    ;
                                         ;2714    ; SYNC POINT DESCRIPTION
                                         ;2715    ;       SUBTST 1 - SYNC0C--LATCH RECEIVER INTERRUPT
                                         ;2716    ;                  SYNC0D--READ IPL ACTIVE BITS
                                         ;2717    ;                  SYNC0E--READ VECTOR BITS
                                         ;2718    ;                  SYNC0F--CLEAR RECEIVER INTERRUPT
                                         ;2719    ;       SUBTST 2 - SYNC10--LATCH INTERVAL TIMER INTERRUPT
                                         ;2720    ;                  SYNC11--READ IPL ACTIVE BITS
                                         ;2721    ;                  SYNC12--READ VECTOR BITS
                                         ;2722    ;                  SYNC13--HIR 18 SHOULD CLEAR
                                         ;2723    ;                  SYNC14--HIR 18 SHOULD CLEAR
                                         ;2724    ;--
                                         ;2725    ;**********************************************************************
                                         ;2726    =0
U 108E, 0000,003D,0180,0800,0000,113A    ;2727    T16C:   NEWTST
U 108F, 0018,0038,0D80,09F8,0000,126C    ;2728            RC[0F]_K[.3]
U 126C, 0818,0038,8DF8,0800,0000,126D    ;2729            D_K[.1F],Q_0                    ; GENERATE MASK FOR IPL ACTIVE
U 126D, 0000,003C,6580,0800,0084,726E    ;2730            SC_K[.10]                       ; ...
U 126E, 0D00,003C,018C,0800,0000,126F    ;2731            D_DAL.SC
U 126F, 0001,003C,0180,0A90,0000,1094    ;2732            R[2]_D                          ; EQUALS 001F0000
U 1094, 0000,003D,0180,0800,0000,117C    ;2733    =0      CALL,J/UNJAM                    ; CLEAR ANY SBI INTERRUPTS
                                         ;2734
                                         ;2735    ;////////////////////////////////////////////////////////////////////
                                         ;2736    ;+
                                         ;2737    ;  CHECK HIR 14 (ALSO IPL ACTIVE 14) BY SETTING THE INTERRUPT
                                         ;2738    ; ENABLE BIT IN THE RXCS REGISTER
                                         ;2739    ;-
                                         ;2740
U 1095, 00C3,003C,0180,09E0,0000,1096    ;2741    T16CS1: RC[0C]_0
U 1096, 0000,003D,0180,0800,0000,1169    ;2742    =0      SUBTEST
U 1097, 0000,003C,6580,0800,0084,7270    ;2743            SC_K[.10]                       ; SETUP FOR A WORD SHIFT
U 1270, 0818,0038,21F8,0800,0000,1271    ;2744            D_K[.14],Q_0                    ; GENERATE THE EXPECTED DATA
```

```
U 1271, 0D00,003C,0180,0800,0000,1272    ;2745           D_DAL.SC
U 1272, 0001,003C,0180,09F0,0000,1098    ;2746           RC[0E]_D                      ; SAVE
U 1098, 0018,0039,4180,0AD0,0000,1174    ;2747   =0      SETRXCS[.80]                  ; SET THE READY BIT IN THE RXCS
U 1099, 0000,003C,0180,0800,0000,109A    ;2748           NOP
U 109A, 0000,003D,0180,0800,0000,114E    ;2749   =0      ERLOOP
U 109B, 0818,0038,3180,0800,0000,1273    ;2750           D_K[.40]
U 1273, 0000,003C,1180,3C00,0000,1274    ;2751           ID[RXCS]_D                    ; SET THE INTERRUPT ENABLE BIT
U 1274, 0000,003C,0180,0800,0000,1275    ;2752           NOP                           ; ALLOW SYNC CREC INTR TO SET
U 1275, 0000,003C,0180,0800,4000,1276    ;2753   SYNC0C: INTRPT.STROBE                 ; LATCH THE CONSOLE INTERRUPT
U 1276, 0310,0038,39F0,2D70,0000,1277    ;2754   SYNC0D: Q_ID[SIR],D_RC[0E]            ; READ THE IPL ACTIVE BITS
U 1277, 001C,0034,01C0,0A10,0000,1278    ;2755           Q_Q.AND.R[2]                  ; MASK
U 1278, 001D,2000,0180,0800,0010,1279    ;2756           A[U_Q-D,CLK.UBCC              ; CHECK
U 1279, 0000,013C,0180,0800,0000,109C    ;2757           Z?
U 109C, 0001,203D,0180,09E8,0000,1151    ;2758   =0      ERROR2,RC[0D]_Q               ; IPL ACTIVE INCORRECT
                                         ;2759
                                         ;2760   ;+
                                         ;2761   ; NOW CHECK THE VECTOR FOR IPL ACTIVE 14
                                         ;2762   ;-
                                         ;2763
U 109D, 0018,0038,0580,09E0,0000,109E    ;2764           RC[0C]_K[.1]                  ; SET THE ERROR TYPE FLAG
U 109E, 0818,0039,6180,0800,0000,115C    ;2765   =0      D_K[.F],CALL,J/DC8            ; GENERATE THE VECTOR
U 109F, 0001,003C,0180,09F0,C000,10A0    ;2766           RC[0E]_D                      ; SAVE
U 10A0, 0000,003D,0180,0800,0000,114E    ;2767   =0      ERLOOP
U 10A1, 0810,0038,35F0,2D70,0000,127A    ;2768   SYNC0E: Q_ID[VECTOR],D_RC[0E]         ; READ THE VECTOR REG
U 127A, 0019,2034,81C0,0800,0000,127B    ;2769           Q_Q.AND.K[.3FF]               ; MASK
U 127B, 001D,2000,0180,0800,0010,127C    ;2770           A[U_Q-D,CLK.UBCC              ; CHECK
U 127C, 0000,013C,0180,0800,0000,10A2    ;2771           Z?
U 10A2, 0001,203D,0180,09E8,0000,1151    ;2772   =0      ERROR2,RC[0D]_Q               ; VECTOR INCORRECT
                                         ;2773
                                         ;2774   ;+
                                         ;2775   ; NOW CHECK THAT THE INTERRUPT REQUEST CLEARS WITH AN INTERPT ACK
                                         ;2776   ;-
                                         ;2777
U 10A3, 0F00,003C,0180,0800,0000,127D    ;2778           D_0
U 127D, 0000,003C,1180,3C00,0000,127E    ;2779           ID[RXCS]_D                    ; CLEAR INTERRUPT ENABLE
U 127E, 0003,003C,0180,09F0,8000,127F    ;2780   SYNC0F: INTRPT.ACK,RC[0E]_0           ; CLEAR THE INTERRUPT REQUEST
U 127F, 0000,003C,0180,0800,0000,1280    ;2781           NOP                           ; ALLOW SYNC CREC INTR TO CLEAR
U 1280, 0000,003C,0180,0800,4000,1281    ;2782           INTRPT.STROBE                 ; CLEAR HIR 14
U 1281, 0F00,003C,39F0,2C00,0000,1282    ;2783           Q_ID[SIR],D_0                 ; READ THE IPL ACTIVE BITS
U 1282, 001C,0034,01C0,0A10,0000,1283    ;2784           Q_Q.AND.R[2]                  ; MASK
U 1283, 001D,2000,0180,0800,0010,1284    ;2785           A[U_Q-D,CLK.UBCC              ; CHECK
U 1284, 0000,013C,0180,0800,0000,10A4    ;2786           Z?
U 10A4, 0001,203D,0180,09E8,0000,1151    ;2787   =0      ERROR2,RC[0D]_Q               ; IPL 14 DID NOT CLEAR
U 10A5, 0000,003C,0180,0800,0000,10A6    ;2788           NOP
U 10A6, 0018,0039,1980,CAD0,0000,1174    ;2789   =0      SETRXCS[ZERO]                 ; CLEAR THE READY BIT
                                         ;2790
                                         ;2791   ;//////////////////////'//////////////////////////////////////////////
                                         ;2792   ;+
                                         ;2793   ; NOW CHECK THE INTERVAL TIMER INTERRUPT
                                         ;2794   ;-
                                         ;2795
U 10A7, 081B,0000,0580,0800,0000,1285    ;2796   T16CS2: D_0-K[.1]                     ; GET DATA FOR TIMER
U 1285, 0000,003C,2580,3C00,0000,10A8    ;2797           ID[NXT.PER]_D                 ; LOAD THE NEXT INTERVAL REG
U 10A8, 0000,003D,0180,0800,0000,1169    ;2798   =0      SUBTEST
U 10A9, 0818,0038,6580,0800,0000,1286    ;2799           D_K[.10]
```

```
U 1286, 0000,003C,2980,3C00,0000,1287   ;2800           ID[CLK.CS]_D                    ; LOAD THE INTERVAL REGISTER
U 1287, 0000,003C,6580,0800,0084,7288   ;2801           SC_K[.10]                       ; SETUP FOR A WORD SHIFT
U 1288, 0818,0038,21F8,0800,0000,1289   ;2802           D_K[.14],Q_0                    ; GENERATE EXPECTED IPL LEVEL
U 1289, 0819,0014,1180,0800,0000,128A   ;2803           D_D+K[.4]
U 128A, 0D00,003C,0180,0800,0000,128B   ;2804           D_DAL.SC
U 128B, 0001,003C,0180,09F0,0000,128C   ;2805           RC[0E]_D                        ; EQUALS 00180000
U 128C, 0818,0038,3180,0800,0000,128D   ;2806           D_K[.40]
U 128D, 0000,003C,2980,3C00,0000,128E   ;2807           ID[CLK.CS]_D                    ; SET INTERRUPT ENABLE
U 128E, 0003,003C,0180,09E0,0000,10AA   ;2808           RC[0C]_0                        ; SET THE ERROR TYPE FLAG
U 10AA, 0000,003D,0180,0800,0000,114E   ;2809   =0      ERLOOP
U 10AB, 0810,0038,0180,0970,4000,128F   ;2810   SYNC10: INTRPT.STROBE,D_RC[0E]          ; LATCH THE INTERRUPT REQUEST
U 128F, 0000,003C,39F0,2C00,0000,1290   ;2811   SYNC11: Q_ID[SIR]                       ; GET THE IPL ACTIVE BITS
U 1290, 001C,0034,01C0,0A10,0000,1291   ;2812           Q_Q.AND.R[2]                    ; MASK
U 1291, 001D,2000,0180,0800,0010,1292   ;2813           A[U_Q-D.CLK.UBCC                ; CHECK
U 1292, 0000,013C,0180,0800,0000,10AC   ;2814           Z?
U 10AC, 0001,203D,0180,09E8,0000,1151   ;2815   =0      ERROR2,RC[0D]_Q                 ; IPL ACTIVE INCORRECT
                                        ;2816
                                        ;2817   ;+
                                        ;2818   ; NOW CHECK THE VECTOR FOR IPL ACTIVE 18
                                        ;2819   ;-
                                        ;2820
U 10AD, 0018,0038,0580,09E0,0000,1293   ;2821           RC[0C]_K[.1]                    ; SET THE ERROR TYPE FLAG
U 1293, 0018,0038,D180,09F0,0000,10AE   ;2822           RC[0E]_K[.C0]                   ; SET THE EXPECTED VECTOR
U 10AE, 0000,003D,0180,0800,0000,114E   ;2823   =0      ERLOOP
U 10AF, 0810,0038,35F0,2D70,0000,1294   ;2824   SYNC12: Q_ID[VECTOR],D_RC[0E]           ; READ THE VECTOR
U 1294, 0019,2034,81C0,0800,0000,1295   ;2825           Q_Q.AND.K[.3FF]                 ; MASK
U 1295, 001D,2000,0180,0800,0010,1296   ;2826           A[U_Q-D,CLK.UBCC                ; CHECK
U 1296, 0000,013C,0180,0800,0000,10B0   ;2827           Z?
U 10B0, 0001,203D,0180,09E8,0000,1151   ;2828   =0      ERROR2,RC[0D]_Q                 ; VECTOR INCORRECT
                                        ;2829
                                        ;2830   ;+
                                        ;2831   ; NOW CHECK THAT TIMER INTER REQ GOES FALSE WHEN THE INTER ENABLE IS CLEAR
                                        ;2832   ;-
                                        ;2833
U 10B1, 0003,003C,0180,09F0,0000,10B2   ;2834           RC[0E]_0                        ; SET EXPECTED IPL
U 10B2, 0000,003D,0180,0800,0000,114E   ;2835   =0      ERLOOP
U 10B3, 0818,0038,3180,0800,0000,1297   ;2836           D_K[.40]
U 1297, 0000,003C,2980,3C00,0000,1298   ;2837           ID[CLK.CS]_D                    ; SET INTERUPT ENABLE
U 1298, 0F00,003C,0180,0800,4000,1299   ;2838           INTRPT.STROBE,D_0               ; LATCH THE HIR 18
U 1299, 0000,003C,2980,3C00,0000,129A   ;2839           ID[CLK.CS]_D                    ; CLEAR THE INTERUPT ENABLE
U 129A, 0810,0038,0180,0970,4000,129B   ;2840   SYNC13: INTRPT.STROBE,D_RC[0E]          ; CLEAR THE HIR 18
U 129B, 0000,003C,39F0,2C00,0000,129C   ;2841           Q_ID[SIR]                       ; READ THE IPL ACTIVE
U 129C, 001C,0034,01C0,0A10,0000,129D   ;2842           Q_Q.AND.R[2]                    ; MASK
U 129D, 001D,2000,0180,0800,0010,129E   ;2843           A[U_Q-D,CLK.UBCC                ; CHECK
U 129E, 0000,013C,0180,0800,0000,10B4   ;2844           Z?
U 10B4, 0001,203D,0180,09E8,0000,1151   ;2845   =0      ERROR2,RC[0D]_Q                 ; INTERRUPT ENABLE DOES NOT INHIBIT
                                        ;2846                                           ; INTERVAL TIMER INTERRUPT
                                        ;2847
                                        ;2848   ;+
                                        ;2849   ; NOW CHECK THAT THE INTERVAL INTERRUPT GOES AWAY WHEN THE TIMER INT REQ
                                        ;2850   ; IS CLEARED
                                        ;2851   ;-
                                        ;2852
U 10B5, 0000,003C,0180,0800,0000,10B6   ;2853           NOP
U 10B6, 0000,003D,0180,0800,0000,114E   ;2854   =0      ERLOOP
```

```
U 10B7, 0818,0038,6580,0800,0000,129F   ;2855            D_K[.10]
U 129F, 0000,003C,2980,3C00,0000,12A0   ;2856            ID[CLK.CS]_D                    ; RESET THE DIVIDE BY 5 CTR
U 12A0, 0000,003C,0180,0800,0000,12A1   ;2857            NOP                             ; WAIT FOR INTERRUPT REQ
U 12A1, 0000,003C,0180,0800,0000,12A2   ;2858            NOP
U 12A2, 0000,003C,0180,0800,0000,12A3   ;2859            NOP
U 12A3, 0818,0038,D180,0800,4000,12A4   ;2860            INTRPT.STROBE,D_K[.C0]          ; LATCH THE HIR 18
U 12A4, 0000,003C,2980,3C00,0000,12A5   ;2861            ID[CLK.CS]_D                    ; CLEAR THE INTER REQ
U 12A5, 0810,0038,0180,0970,4000,12A6   ;2862   SYNC14:  INTRPT.STROBE,D_RC[0E]          ; CLOCK THE HIR REGISTER
U 12A6, 0000,003C,39F0,2C00,0000,12A7   ;2863            Q_ID[SIR]                       ; READ THE IPL ACTIVE
U 12A7, 001C,0034,01C0,0A10,0000,12A8   ;2864            Q_Q.AND.R[2]                    ; MASK
U 12A8, 001D,2000,0180,0800,0010,12A9   ;2865            A[U_Q-D,CLK.UBCC                ; CHECK
U 12A9, 0000,013C,0180,0800,0000,10B8   ;2866            Z?
U 10B8, 0001,203D,0180,09E8,0000,1151   ;2867   =0       ERROR2,RC[0D]_Q                 ; INT REQ FALSE DID NOT DISABLE
                                        ;2868                                            ; TIMER INTERRUPT
U 10B9, 0F00,003C,0180,0800,0000,12AB   ;2869            D_0
U 12AB, 0000,003C,2980,3C00,0000,10BA   ;2870            ID[CLK.CS]_D                    ; CLEAR THE INTRPT ENABLE
                                        ;2871
                                        ;2872
```

```
                                          ;2873   .PAGE   "TEST 16D       CONSOLE INTERRUPT DISABLE"
                                          ;2874   ;************************************************************************
                                          ;2875   ;++
                                          ;2876   ;
                                          ;2877   ; TEST  16D     CONSOLE INTERRUPT DISABLE
                                          ;2878   ;
                                          ;2879   ; TEST DESCRIPTION
                                          ;2880   ;       THIS TEST CHECKS THAT BIT 8 IN THE MACHINE CONTROL REGISTER, IN THE
                                          ;2881   ;       CONSOLE INTERFACE, DISABLES THE TRANSMITTER AND RECEIVER INTERRUPTS.
                                          ;2882   ;
                                          ;2883   ;       SUBTST 1 - CHECK THE TRANSMITTER INTERRUPT DISABLE
                                          ;2884   ;       SUBTST 2 - CHECK THE RECEIVER INTERRUPT DISABLE
                                          ;2885   ;
                                          ;2886   ; LOGIC DESCRIPTION
                                          ;2887   ;       THIS TEST CHECKS THE LOGIC ON THE CIB MODULE THAT DISABLES THE
                                          ;2888   ;       CNSL XMIT AND CNSL RCV INTR SIGNALS THAT GO TO THE ICL MODULE.
                                          ;2889   ;
                                          ;2890   ; ERROR DESCRIPTION
                                          ;2891   ;       DATA: EXPECTED IPL ACTIVE LEVEL
                                          ;2892   ;             RECIEVED IPL ACTIVE LEVEL
                                          ;2893   ;
                                          ;2894   ; SYNC POINT DESCRIPTION
                                          ;2895   ;       SUBTST 1 - SYNC1F--RCV INTRPT IS STROBED INTO HIR LATCH
                                          ;2896   ;       SUBTST 2 - SYNCB1--XMIT INTRPT IS STROBED INTO HIR LATCH
                                          ;2897   ;                  SYNCB2--XMIT INTRPT IS STROBED INTO HIR LATCH
                                          ;2898   ;--
                                          ;2899   ;************************************************************************
                                          ;2900   =0
U 10BA, 0000,003D,0180,0800,0000,113A     ;2901   T16D:   NEWTST
U 10BB, 0018,0038,0980,09F8,0C00,12AC     ;2902           RC[0F]_K[.2]
U 12AC, 0818,0038,8DF8,0800,0000,12AD     ;2903           D_K[.1F],Q_0                    ; GENERATE THE MASK FOR THE IPL
U 12AD, 0000,003C,6580,0800,0084,72AE     ;2904           SC_K[.10]                       ; ACTIVE BITS
U 12AE, 0D00,003C,0180,0800,0000,12AF     ;2905           D_DAL.SC                        ; ...
U 12AF, 0001,003C,0180,0A90,0000,10BC     ;2906           R[2]_D                          ; SAVE IN R2
U 10BC, 0000,003D,0180,0800,0000,117C     ;2907   =0      CALL,J/UNJAM
                                          ;2908
                                          ;2909   ;////////////////////////////////////////////////////////////////////////
                                          ;2910   ;+
                                          ;2911   ; FIRST CHECK THAT THE TRANSMITTER INTERRUPT IS DISABLED
                                          ;2912   ;-
                                          ;2913
U 10BD, 0000,003C,0180,0800,0000,10BE     ;2914   T16DS1: NOP
U 10BE, 0000,003D,0180,0800,0000,1169     ;2915   =0      SUBTEST
U 10BF, 0003,003C,0180,09F0,0000,10C0     ;2916           RC[0E]_0                        ; SET THE EXPECTED IPL ACTIVE LEVEL
U 10C0, 0000,003D,0180,0800,0000,114E     ;2917   =0      ERLOOP
U 10C1, 0F00,003C,0180,0800,0000,12B0     ;2918           D_0
U 12B0, 0000,003C,1980,3C00,0000,10C2     ;2919           ID[TXCS]_D                      ; ENSURE INTRPT ENABLE CLEAR
U 10C2, 0018,0039,1980,0AD0,0000,116E     ;2920   =0      SETMCR[ZERO]                    ; CLEAR INTRPT DISABLE BIT
U 10C3, 0818,0038,3180,0800,0000,12B1     ;2921           D_K[.40]
U 12B1, 0000,003C,1980,3C00,0000,12B2     ;2922           ID[TXCS]_D                      ; SET THE INTERRUPT ENABLE BIT
U 12B2, 0818,0038,4180,0800,0000,12B3     ;2923           D_K[.80]
U 12B3, 0500,003C,0180,0800,0000,10C4     ;2924           D_D.LEFT                        ; GEN PATTERN TO SET INTRPT DISABLE
U 10C4, 0001,003D,0180,0AD0,0000,116E     ;2925   =0      R[0A]_D,CALL,J/SETMCR           ; SET THE INTRPT DISABLE BIT
U 10C5, 0000,003C,0180,0800,0000,12B4     ;2926           NOP                             ; ALLOW SYNC CXMT TO CLEAR
U 12B4, 0000,003C,0180,0800,4000,12B5     ;2927   SYNC1F: INTRPT.STROBE                   ; LATCH THE INTRPT SIGNAL
```

```
U 12B5, 0F00,003C,39F0,2C00,0000,12B6   ;2928           Q_ID[SIR],D_0                   ; READ THE IPL ACTIVE BITS
U 12B6, 001C,0034,01C0,0A10,0000,12B7   ;2929           Q_Q.AND.R[2]                    ; MASK
U 12B7, 001D,2000,0180,0800,0010,12B8   ;2930           A[U_Q-D,CLK.UBCC                ; CHECK
U 12B8, 0000,013C,0180,0800,0000,10C6   ;2931           Z?
U 10C6, 0001,203D,0180,09E8,0000,1151   ;2932   =0      ERROR2,RC[0D]_Q                 ; INTRPT DISABLE DID NOT INHIBIT TRANSMITTER
                                        ;2933                                           ; INTERRUPT.
                                        ;2934   ;+
                                        ;2935   ; NOW CHECK THAT THE INTERRUPT ENABLE BIT BEING OFF DISABLES THE INTERRUPT
                                        ;2936   ;-
                                        ;2937
U 10C7, 0000,003C,0180,0800,0000,10C8   ;2938           NOP
U 10C8, 0018,0039,1980,0AD0,0000,116E   ;2939   =0      SETMCR[ZERO]                    ; CLEAR INTERPT DISABLE BIT
U 10C9, 0000,003C,0180,0800,0000,10CA   ;2940           NOP
U 10CA, 0000,003D,0180,0800,0000,114E   ;2941   =0      ERLOOP
U 10CB, 0F00,003C,0180,0800,0000,12B9   ;2942           D_0
U 12B9, 0000,003C,1980,3C00,0000,12BA   ;2943           ID[TXCS]_D                      ; CLEAR INTERRUPT ENABLE BIT
U 12BA, 0818,0038,3180,0800,0000,12BB   ;2944           D_K[.40]
U 12BB, 0F00,003C,1980,3C00,0000,12BC   ;2945           ID[TXCS]_D,D_0                  ; SET INTERRUPT ENABLE (SETS FLOP)
U 12BC, 0000,003C,1980,3C00,0000,12BD   ;2946           ID[TXCS]_D                      ; CLEAR INTERRUPT ENABLE BIT
                                        ;2947                                           ; SHOULD DISABLE INTRPT REQUEST
U 12BD, 0000,003C,0180,0800,0000,12BE   ;2948           NOP                             ; ALLOW SYNC TO CLOCK
U 12BE, 0000,003C,0180,0800,4000,12BF   ;2949           INTRPT.STROBE                   ; LATCH THE SYNC SIGNAL
U 12BF, 0F00,003C,39F0,2C00,0000,12C0   ;2950           Q_ID[SIR],D_0                   ; READ THE IPL ACTIVE BITS
U 12C0, 001D,2000,0180,0800,0010,12C1   ;2951           A[U_Q-D,CLK.UBCC                ; CHECK IPL ACTIVE FOR ZERO
U 12C1, 0000,013C,0180,0800,0000,10CC   ;2952           Z?
U 10CC, 0001,203D,0180,09E8,0000,1151   ;2953   =0      ERROR2,RC[0D]_Q                 ; INTRPT ENABLE DID NOT DISABLE INTRP REQ
                                        ;2954
                                        ;2955
                                        ;2956   ;//////////////////////////////////////////////////////////////////////
                                        ;2957   ;+
                                        ;2958   ; NOW CHECK THE RECEIVER INTERRUPT DISABLE
                                        ;2959   ;-
                                        ;2960
U 10CD, 0000,003C,0180,0800,0000,10CE   ;2961   T16DS2: NOP
U 10CE, 0000,003D,0180,0800,0000,1169   ;2962   =0      SUBTEST
U 10CF, 0000,003C,0180,0800,0000,10D0   ;2963           NOP
U 10D0, 0000,003D,0180,0800,0000,114E   ;2964   =0      ERLOOP
U 10D1, 0F00,003C,0180,0800,0000,12C2   ;2965           D_0
U 12C2, 0000,003C,1180,3C00,0000,10D2   ;2966           ID[RXCS]_D                      ; ENSURE INTRPT ENABLE CLEAR
U 10D2, 0018,0039,1980,0AD0,0000,116E   ;2967   =0      SETMCR[ZERO]                    ; ENSURE INTRPT DISABLE CLEAR
U 10D3, 0818,0038,3180,0800,0000,12C3   ;2968           D_K[.40]
U 12C3, 0000,003C,1180,3C00,0000,10D4   ;2969           ID[RXCS]_D                      ; SET THE INTERRUPT ENABLE BIT
U 10D4, 0018,0039,4180,0AD0,0000,1174   ;2970   =0      SETRXCS[.80]                    ; SET THE READY BIT
U 10D5, 0818,0038,4180,0800,0000,12C4   ;2971           D_K[.80]
U 12C4, 0500,003C,0180,0800,0000,10D6   ;2972           D_D.LEFT                        ; GEN PATTERN TO SET INTRPT DISABLE
U 10D6, 0001,003D,0180,0AD0,0000,116E   ;2973   =0      R[0A]_D,CALL,J/SETMCR           ; SET THE INTRPT DISABLE BIT
U 10D7, 0000,003C,0180,0800,0000,12C5   ;2974           NOP                             ; ALLOW SYNC CXMT TO CLEAR
U 12C5, 0000,003C,0180,0800,4000,12C6   ;2975   SYNCB1: INTRPT.STROBE                   ; LATCH THE INTRPT SIGNAL
U 12C6, 0F00,003C,39F0,2C00,0000,12C7   ;2976           Q_ID[SIR],D_0                   ; READ THE IPL ACTIVE BITS
U 12C7, 001C,0034,01C0,0A10,0000,12C8   ;2977           Q_Q.AND.R[2]                    ; MASK
U 12C8, 001D,2000,0180,0800,0010,12C9   ;2978           A[U_Q-D,CLK.UBCC                ; CHECK
U 12C9, 0000,013C,0180,0800,0000,10D8   ;2979           Z?
U 10D8, 0001,203D,0180,09E8,0000,1151   ;2980   =0      ERROR2,RC[0D]_Q                 ; INTRPT DISABLE DID NOT INHIBIT RECEIVER
                                        ;2981                                           ; INTERRUPT.
                                        ;2982
```

```
                                          ;2983   ;+
                                          ;2984   ; NOW CHECK THAT THE INTRPT DISABLE BIT DISABLES THE JK FLIP FLOP ON THE
                                          ;2985   ; CIB MODULE.
                                          ;2986   ;-
                                          ;2987
U 10D9, 0000,003C,0180,0800,0000,10DA     ;2988           NOP
U 10DA, 0000,003D,0180,0800,0000,114E     ;2989   =0      ERLOOP
U 10DB, 0000,003C,0180,0800,0000,10DC     ;2990           NOP
U 10DC, 0018,0039,1980,0AD0,0000,116E     ;2991   =0      SETMCR[ZERO]                    ; CLEAR INTRPT DISABLE BIT
U 10DD, 0000,003C,0180,0800,4000,12CA     ;2992           INTRPT.STROBE                   ; SET HIR 14
U 12CA, 0F00,003C,0180,0800,8000,12CB     ;2993           D_0,INTRPT.ACK                  ; CLEAR THE FLIP FLOP
U 12CB, 0000,003C,1180,3C00,0000,12CC     ;2994           ID[RXCS]_D                      ; ENSURE INTRPT ENABLE CLEAR
U 12CC, 0818,0038,4180,0800,4000,12CD     ;2995           D_K[.80],INTRPT.STROBE          ; CLEAR HIR 14
U 12CD, 0500,003C,0180,0800,0000,10DE     ;2996           D_D.LEFT
U 10DE, 0001,003D,0180,0AD0,0000,116E     ;2997   =0      R[0A]_D,CALL,J/SETMCR           ; SET THE INTRPT DISABLE BIT
U 10DF, 0818,0038,3180,0800,0000,12CE     ;2998           D_K[.40]
U 12CE, 0000,003C,1180,3C00,0000,10E0     ;2999   SYNCB2: ID[RXCS]_D                      ; SET THE INTRPT ENABLE BIT
                                          ;3000                                           ; FLIP FLOP SHOULD NOT SET
U 10E0, 0018,0039,1980,0AD0,0000,116E     ;3001   =0      SETMCR[ZERO]                    ; CLEAR THE INTRPT DISABLE
U 10E1, 0000,003C,0180,0800,0000,12CF     ;3002           NOP                             ; ALLOW SYNC CXMT TO CLOCK
U 12CF, 0000,003C,0180,0800,4000,12D0     ;3003           INTRPT.STROBE                   ; STROBE INTRPT IF IT IS THERE
U 12D0, 0F00,003C,39F0,2C00,0000,12D1     ;3004           Q_ID[SIR],D_0                   ; READ THE IPL ACTIVE BITS
U 12D1, 001C,0034,01C0,0A10,0000,12D2     ;3005           Q_Q.AND.R[2]                    ; MASK
U 12D2, 001D,2000,0180,0800,0010,12D3     ;3006           A[U_Q-D,CLK.UBCC                ; CHECK
U 12D3, 0000,013C,0180,0800,0000,10E2     ;3007           Z?
U 10E2, 0001,203D,0180,09E8,0000,1151     ;3008   =0      ERROR2,RC[0D]_Q                 ; INTRPT DISABLE DID NOT INHIBIT LOADING
                                          ;3009                                           ; THE FLIP FLOP ON CIB
                                          ;3010
                                          ;3011   ;+
                                          ;3012   ; NOW CHECK THAT THE INTERRUPT ENABLE BIT DISABLES THE INTERRUPT REQUEST
                                          ;3013   ; WHEN IT IS CLEAR
                                          ;3014   ;-
                                          ;3015
U 10E3, 0000,003C,0180,0800,0000,10E4     ;3016           NOP
U 10E4, 0018,0039,1980,0AD0,0000,116E     ;3017   =0      SETMCR[ZERO]                    ; CLEAR THE INTRPT DISABLE BIT
U 10E5, 0000,003C,0180,0800,0000,10E6     ;3018           NOP
U 10E6, 0000,003D,0180,0800,0000,114E     ;3019   =0      ERLOOP
U 10E7, 0F00,003C,0180,0800,0000,12D4     ;3020           D_0
U 12D4, 0000,003C,1180,3C00,0000,12D5     ;3021           ID[RXCS]_D                      ; CLEAR INTRPT ENABLE BIT
U 12D5, 0818,0038,3180,0800,0000,12D6     ;3022           D_K[.40]
U 12D6, 0F00,003C,1180,3C00,0000,12D7     ;3023           ID[RXCS]_D,D_0                  ; SET THE INTRPT ENABLE
U 12D7, 0000,003C,1180,3C00,0000,12D8     ;3024           ID[RXCS]_D                      ; CLEAR THE BIT, SHOULD DIABLE
                                          ;3025                                           ; INTRPT REQUEST
U 12D8, 0000,003C,0180,0800,0000,12D9     ;3026           NOP                             ; ALLOW SYNC TO CLEAR
U 12D9, 0000,003C,0180,0800,4000,12DA     ;3027           INTRPT.STROBE                   ; LATCH THE INTRPT REQ SIGNAL
U 12DA, 0F00,003C,39F0,2C00,0000,12DB     ;3028           Q_ID[SIR],D_0                   ; READ THE IPL ACTIVE BITS
U 12DB, 001D,2000,0180,0800,0010,12DC     ;3029           A[U_Q-D,CLK.UBCC                ; CHECK IPL ACTIVE
U 12DC, 0000,013C,0180,0800,0000,10E8     ;3030           Z?
U 10E8, 0001,203D,0180,09E8,0000,1151     ;3031   =0      ERROR2,RC[0D]_Q                 ; INTRPT ENABLE CLEAR DID NOT DISABLE
                                          ;3032                                           ; THE INTPRT REQUEST
U 10E9, 0000,003C,0180,0800,0000,10EA     ;3033           NOP
U 10EA, 0018,0039,1980,0AD0,0000,1174     ;3034   =0      SETRXCS[ZERO]                   ; CLEAR THE READY BIT
U 10EB, 0F00,003C,0180,0800,0000,12DD     ;3035           D_0
U 12DD, 0000,003C,1180,3C00,0000,12DE     ;3036           ID[RXCS]_D                      ; AND THE INTRPT ENABLE BITS
U 12DE, 0000,003C,1980,3C00,0000,12DF     ;3037           ID[TXCS]_D                      ; ...
```

```
U 12DF, 0000,003C,0180,0800,0000,12E0   ;3038           NOP
U 12E0, 0000,003C,0180,0800,4000,10EC   ;3039           INTRPT.STROBE                      ; CLEAR THE HIR LEVEL
                                        ;3040
                                        .PAGE   "TEST 16E       ID BUS 'ATEMP' REGISTERS"
                                        ;***************************************************************************
                                        ;++
                                        ;
                                        ; TEST  16E     ID BUS "ATEMP" REGISTERS
                                        ;
                                        ; TEST DESCRIPTION
                                        ;
                                        ;       THIS TEST CHECKS THE 12 ATEMP REGISTERS ON THE ID BUS.
                                        ;
                                        ;       SUBTST 1 - FLOAT A ZERO THRU REGISTER ADDRESS 24
                                        ;       SUBTST 2 - FLOAT A ONE THRU REGISTER ADDRESS 24
                                        ;       SUBTST 3 - WRITE A DATA PATTERN IN EACH ADDRESS OF EACH CHIP OF
                                        ;                  THE ATEMP REGISTERS AND CHECK FOR DUAL ADDRESSING.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS SOME OF THE ID BUS ADDRESS DECODE ON THE ICL
                                        ;       MODULE AND THE ATEMP REGISTERS ON THE ICL AND CEH MODULES.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED DATA PATTERN
                                        ;             RECEIVED DATA PATTERN
                                        ;             LOOP COUNT FOR SUBTESTS 1 AND 2, ATEMP REGISTER ADDRESS
                                        ;               FOR SUBTEST 3.
                                        ;               THE LOOP COUNT INDICATES WHICH BIT IS BEING TESTED, I.E.
                                        ;               20=BIT 0, 1F=BIT 1, 1E=BIT 2, ETC.
                                        ;               THE REGISTER ADDRESS INDICATES WHICH REGISTER WAS DUAL ADDRESSED
                                        ;               WHILE WRITING THE ATEMP REGISTERS.
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       SUBTST 1 - SYNC00--ATEMP REGISTER IS LOADED
                                        ;                  SYNC01--ATEMP IS READ
                                        ;       SUBTST 2 - SYNC02--ATEMP REGISTER IS LOADED
                                        ;                  SYNC03--ATEMP IS READ
                                        ;       SUBTST 3 - SYNC04--ATEMP REGISTERS ARE LOADED WITH THE PATTERN
                                        ;                  SYNC05--ATEMP REGISTERS ARE READ.
                                        ;               NOTE: SINCE SYNC04 AND SYNC05 ARE WITHIN LOOPS, YOU MAY HAVE
                                        ;                     TO STEP TO THE WRITE OR READ OF THE APPROPRIATE
                                        ;                     REGISTER.
                                        ;--
                                        ;***************************************************************************
                                        =0
U 10EC, 0000,003D,0180,0800,0000,113A   T16E:   NEWTST
U 10ED, 0018,0038,0D80,09F8,0000,12E1           RC[0F]_K[.3]

                                        ;//////////////////////////////////////////////////////////////////////////
                                        ;+
                                        ; FIRST FLOAT A ZERO THRU THE ATEMP REGISTER AT ADDRESS 24
                                        ;-

U 12E1, 0018,0038,7580,09E0,0000,10EE   T16ES1: RC[0C]_K[.20]                   ; SET THE LOOP COUNT
U 10EE, 0000,003D,0180,0800,0000,1169   =0      SUBTEST
U 10EF, 0000,003C,E980,0800,0084,72E2           SC_K[.24]                       ; SET THE ATEMP ADDRESS
U 12E2, 0818,0038,F180,0800,0000,12E3           D_K[.FFFC]                      ; GENERATE THE INITIAL DATA PATTERN
U 12E3, 081A,4014,0980,0800,0000,12E4           D_D.SXT[WORD]+K[.2]             ; ...
```

```
U 12E4, 0001,003C,0180,09F0,0000,10F0   ;3096           RC[0E]_D                        ; SAVE
U 10F0, 0000,003D,0180,0800,0000,114E   ;3097   =0      ERLOOP
U 10F1, 0810,0038,0180,0970,0000,12E5   ;3098   T16EL1: D_RC[0E]                        ; GET THE DATA PATTERN
U 12E5, 0000,003C,0180,3400,0000,12E6   ;3099   SYNC00: ID(SC)_D                        ; WRITE THE REGISTER
U 12E6, 0000,003C,01F0,2400,0000,12E7   ;3100   SYNC01: Q_ID(SC)                        ; READ THE REGISTER
U 12E7, 001D,A000,0180,0800,0010,12E8   ;3101           ALU_Q-D,CLK.UBCC,BYTE           ; CHECK THE DATA
U 12E8, 0000,013C,0180,0800,0000,10F2   ;3102           Z?                              ; BRANCH IF OK
U 10F2, 0001,203D,0180,09E8,0000,1151   ;3103   =0      ERROR2,RC[0D]_Q
                                        ;3104
                                        ;3105   ;+
                                        ;3106   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3107   ;-
                                        ;3108
U 10F3, 0010,0038,01C0,0970,0000,12E9   ;3109           Q_RC[0E]                        ; GET CURRENT DATA PATTERN
U 12E9, 0000,003C,03A8,0800,0000,12EA   ;3110           Q_Q.LEFT,SI/MUL-                ; GENERATE NEXT PATTERN
U 12EA, 0001,203C,0180,09F0,0000,12EB   ;3111           RC[0E]_Q                        ; SAVE
U 12EB, 0810,0038,0180,0960,0000,12EC   ;3112           D_RC[0C]                        ; GET THE LOOP COUNT
U 12EC, 0019,8000,0580,09E0,0010,12ED   ;3113           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT AND CHECK
U 12ED, 0000,013C,0180,0800,0000,10F4   ;3114           Z?
U 10F4, 0000,003C,0180,0800,0000,10F1   ;3115   =0      J/T16EL1                        ; CONTINUE TESTING
                                        ;3116
                                        ;3117   ;//////////////////////////////////////////////////////////////////////
                                        ;3118   ;+
                                        ;3119   ; NOW FLOAT A ONE THRU ATEMP REGISTER 24
                                        ;3120   ;-
                                        ;3121
U 10F5, 0018,0038,7580,09E0,0000,10F6   ;3122   T16ES2: RC[0C]_K[.20]                   ; SET THE LOOP COUNT
U 10F6, 0000,003D,0180,0800,0000,1169   ;3123   =0      SUBTEST
U 10F7, 0018,0038,0580,09F0,0000,10F8   ;3124           RC[0E]_K[.1]                    ; INITIALIZE THE DATA PATTERN
U 10F8, 0000,003D,0180,0800,0000,114E   ;3125   =0      ERLOOP
U 10F9, 0810,0038,0180,0970,0000,12EE   ;3126   T16EL2: D_RC[0E]                        ; GET THE DATA PATTERN
U 12EE, 0000,003C,0180,3400,0000,12EF   ;3127   SYNC02: ID(SC)_D                        ; LOAD THE REGISTER
U 12EF, 0000,003C,01F0,2400,0000,12F0   ;3128   SYNC03: Q_ID(SC)                        ; READ THE REGISTER
U 12F0, 001D,2000,0180,0800,0010,12F1   ;3129           ALU_Q-D,CLK.UBCC                ; CHECK THE DATA
U 12F1, 0000,013C,0180,0800,0000,10FA   ;3130           Z?                              ; BRANCH IF OK
U 10FA, 0001,203D,0180,09E8,0000,1151   ;3131   =0      ERROR2,RC[0D]_Q                 ; ATEMP DATA PATH FAILED
                                        ;3132
                                        ;3133   ;+
                                        ;3134   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3135   ;-
                                        ;3136
U 10FB, 0010,0038,01C0,0970,0000,12F2   ;3137           Q_RC[0E]                        ; GET THE DATA PATTERN
U 12F2, 0021,203C,0180,09F0,0000,12F3   ;3138           RC[0E]_Q.LEFT                   ; GENERATE NEXT PATTERN
U 12F3, 0810,0038,0180,0960,0000,12F4   ;3139           D_RC[0C]                        ; GET THE LOOP COUNT
U 12F4, 0019,8000,0580,09E0,0010,12F5   ;3140           RC[0C]_D-K[.1],CLK.UBCC,BYTE    ; DECREMENT AND CHECK
U 12F5, 0000,013C,0180,0800,0000,10FC   ;3141           Z?
U 10FC, 0000,003C,0180,0800,0000,10F9   ;3142   =0      J/T16EL2                        ; CONTINUE
                                        ;3143
                                        ;3144   ;//////////////////////////////////////////////////////////////////////
                                        ;3145   ;+
                                        ;3146   ; NOW WRITE A DATA PATTERN IN ALL 12 ATEMP REGISTERS AND READ IT BACK
                                        ;3147   ; AND CHECK IT. THIS IS A DUAL ADDRESSING TEST.
                                        ;3148   ;-
                                        ;3149
U 10FD, 0818,0038,6580,0800,0000,12F6   ;3150   T16ES3: D_K[.10]                        ; GENERATE THE DATA PATTERN
```

```
U 12F6, 0819,0014,0580,0A80,0000,12F7   ;3151           R[0]_D+K[.1],D_ALU              ; TO INCREMENT THE DATA
U 12F7, 0000,003C,0180,0A00,0000,12F8   ;3152           LAB_R[0]                        ; PATTERN THAT GETS WRITTEN
U 12F8, 0000,003C,01F8,0800,0084,72F9   ;3153           SC_K[.8],Q_0                    ; INTO EACH OF THE ATEMP
U 12F9, 0D00,003C,0180,0800,0000,12FA   ;3154           D_DAL.SC                        ; REGISTERS
U 12FA, 081C,2014,0180,0800,0000,12FB   ;3155           D_LA+D                          ; ...
U 12FB, 0D00,003C,0180,0800,0000,12FC   ;3156           D_DAL.SC                        ; ...
U 12FC, 081C,2014,0180,0800,0000,12FD   ;3157           D_LA+D                          ; ...
U 12FD, 0D00,003C,0180,0800,0000,12FE   ;3158           D_DAL.SC                        ; ...
U 12FE, 001C,2014,0180,0A80,0000,10FE   ;3159           R[0]_LA+D                       ; EQUALS 11111111
U 10FE, 0000,003D,0180,0800,0000,1169   ;3160   =0      SUBTEST
U 10FF, 0818,0038,7980,0800,0000,12FF   ;3161           D_K[.30]
U 12FF, 0019,0000,0580,0A88,0000,110A   ;3162           R[1]_D-K[.1]                    ; GENERATE A CONSTANT 2F
                                        ;3163
U 110A, 0000,003D,0180,0800,0000,114E   ;3164   =0      ERLOOP
U 110B, 0F00,003C,E980,0800,0084,7302   ;3165           SC_K[.24],D_0                   ; SET ADDRESS OF FIRST ATEMP AND
                                        ;3166                                           ; INITIAL DATA PATTERN
                                        ;3167   SYNC04:
U 1302, 0000,003C,0180,3600,0000,1303   ;3168   T16EL3: ID(SC)_D,LAB_R[0]               ; LOAD THE REGISTER
U 1303, 081C,2014,0180,0800,0000,1304   ;3169           D_LA+D                          ; INCREMENT PATTERN TO WRITE
U 1304, 0000,003C,01C0,0A08,0000,1305   ;3170           Q_R[1]
U 1305, 0019,A000,1D80,0800,0010,1306   ;3171           ALU_Q-SC,CLK.UBCC,BYTE          ; FINISHED LOADING YET?
U 1306, 0000,013C,0180,0800,0080,D110   ;3172           Z?,SC_SC+1                      ; BRANCH IF YES
U 1110, 0000,003C,0180,0800,0000,1302   ;3173   =0      J/T16EL3                        ; CONTINUE LOADING
                                        ;3174
                                        ;3175   ;+
                                        ;3176   ; NOW READ EACH ATEMP
                                        ;3177   ;-
                                        ;3178
U 1111, 0000,003C,E980,0800,0084,7307   ;3179           SC_K[.24]                       ; SET THE START ADDRESS
U 1307, 0000,003C,0180,09F0,0000,1308   ;3180           RC[0E]_0                        ; INIT THE EXPECTED DATA
U 1308, 0018,0038,1D80,09E0,0000,1309   ;3181   T16EL4: RC[0C]_SC                       ; SAVE CURRENT ATEMP ADDRESS
U 1309, 0810,0038,0180,0970,0000,130A   ;3182           D_RC[0E]                        ; GET EXPECTED DATA
U 130A, 0000,003C,01F0,2400,0000,130B   ;3183   SYNC05: Q_ID(SC)                        ; READ THE REGISTER
U 130B, 001D,2000,0180,0800,0010,130C   ;3184           ALU_Q-D,CLK.UBCC                ; CHECK THE DATA
U 130C, 0000,013C,0180,0800,0000,1112   ;3185           Z?                              ; BRANCH IF OK
U 1112, 0001,203D,0180,09E8,0000,1151   ;3186   =0      ERROR2,RC[0D]_Q                 ; DATA CHANGED IN ONE OF THE REGISTERS
                                        ;3187
                                        ;3188   ;+
                                        ;3189   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3190   ;-
                                        ;3191
U 1113, 0810,0038,0180,0970,0000,130D   ;3192           D_RC[0E]                        ; GET CURRENT EXPECTED DATA
U 130D, 0000,003C,0180,0A00,0000,130E   ;3193           LAB_R[0]                        ; LATCH INCREMENT CONSTANT
U 130E, 001C,2014,0180,09F0,0000,130F   ;3194           RC[0E]_LA+D                     ; SET NEXT EXPECTED DATA
U 130F, 0000,003C,01C0,0A08,0000,1310   ;3195           Q_R[1]
U 1310, 0019,A000,1D80,0800,0010,1311   ;3196           ALU_Q-SC,CLK.UBCC,BYTE          ; DONE CHECKING YET?
U 1311, 0000,013C,0180,0800,0080,D114   ;3197           Z?,SC_SC+1                      ; BRANCH IF YES
U 1114, 0000,003C,0180,0800,0000,1308   ;3198   =0      J/T16EL4                        ; CONTINUE CHECKING
U 1115, 0000,003C,0180,0800,0000,1116   ;3199           NOP
```

```
                                        .PAGE   "TEST 16F       ID BUS 'BTEMP' REGISTERS"
                                        ;*****************************************************************
                                        ;++
                                        ;
                                        ; TEST  16F     ID BUS "BTEMP" REGISTERS
                                        ;
                                        ; TEST DESCRIPTION
                                        ;
                                        ;       THIS TEST CHECKS THE 12 BTEMP REGISTERS ON THE ID BUS.
                                        ;
                                        ;       SUBTST 1 - FLOAT A ZERO THRU REGISTER ADDRESS 24
                                        ;       SUBTST 2 - FLOAT A ONE THRU REGISTER ADDRESS 24
                                        ;       SUBTST 3 - WRITE A DATA PATTERN IN EACH ADDRESS OF EACH CHIP OF
                                        ;                  THE BTEMP REGISTERS AND CHECK FOR DUAL ADDRESSING.
                                        ;
                                        ; LOGIC DESCRIPTION
                                        ;       THIS TEST CHECKS SOME OF THE ID BUS ADDRESS DECODE ON THE ICL
                                        ;       MODULE AND THE BTEMP REGISTERS ON THE ICL AND CEH MODULES.
                                        ;
                                        ; ERROR DESCRIPTION
                                        ;       DATA: EXPECTED DATA PATTERN
                                        ;             RECEIVED DATA PATTERN
                                        ;             LOOP COUNT FOR SUBTESTS 1 AND 2, BTEMP REGISTER ADDRESS
                                        ;               FOR SUBTEST 3.
                                        ;               THE LOOP COUNT INDICATES WHICH BIT IS BEING TESTED, I.E.
                                        ;               20=BIT 0, 1F=BIT 1, 1E=BIT 2, ETC.
                                        ;               THE REGISTER ADDRESS INDICATES WHICH REGISTER WAS DUAL ADDRESSED
                                        ;               WHILE WRITING THE BTEMP REGISTERS.
                                        ;
                                        ; SYNC POINT DESCRIPTION
                                        ;       SUBTST 1 - SYNC06--BTEMP REGISTER IS LOADED
                                        ;                  SYNC07--BTEMP IS READ
                                        ;       SUBTST 2 - SYNC08--BTEMP REGISTER IS LOADED
                                        ;                  SYNC09--BTEMP IS READ
                                        ;       SUBTST 3 - SYNC0A--BTEMP REGISTERS ARE LOADED WITH THE PATTERN
                                        ;                  SYNC0B--BTEMP REGISTERS ARE READ.
                                        ;               NOTE: SINCE SYNC0A AND SYNC0B ARE WITHIN LOOPS, YOU MAY HAVE
                                        ;                     TO STEP TO THE WRITE OR READ OF THE APPROPRIATE
                                        ;                     REGISTER.
                                        ;--
                                        ;*****************************************************************
                                        =0
U 1116, 0000,003D,0180,0800,0000,113A   T16F:   NEWTST
U 1117, 0018,0038,0D80,09F8,0000,1312           RC[0F]_K[.3]

                                        ;/////////////////////////////////////////////////////////////////
                                        ;+
                                        ; FIRST FLOAT A ZERO THRU THE BTEMP REGISTER AT ADDRESS 24
                                        ;-

U 1312, 0018,0038,7580,09E0,0000,1118   T16FS1: RC[0C]_K[.20]                   ; SET THE LOOP COUNT
U 1118, 0000,003D,0180,0800,0000,1169   =0      SUBTEST
U 1119, 0000,003C,7980,0800,0084,7313           SC_K[.30]                       ; SET THE BTEMP ADDRESS
U 1313, 0818,0038,F180,0800,0000,1314           D_R[.FFFC]                      ; GENERATE THE INITIAL DATA PATTERN
U 1314, 081A,4014,0980,0800,0000,1315           D_D.SXT[WORD]+K[.2]             ; ...
```

```
U 1315, 0001,003C,0180,09F0,0000,111A   ;3255          RC[0E]_D                       ; SAVE
U 111A, 0000,003D,0180,0800,0000,114E   ;3256   =0     ERLOOP
U 111B, 0810,0038,0180,0970,0000,1316   ;3257   T16FL1: D_RC[0E]                      ; GET THE DATA PATTERN
U 1316, 0000,003C,0180,3400,0000,1317   ;3258   SYNC06: ID(SC)_D                      ; WRITE THE REGISTER
U 1317, 0000,003C,01F0,2400,0000,1318   ;3259   SYNC07: Q_ID(SC)                      ; READ THE REGISTER
U 1318, 001D,A000,0180,0800,0010,1319   ;3260          A[U_Q-D,CLK.UBCC,BYTE          ; CHECK THE DATA
U 1319, 0000,013C,0180,0800,0000,111C   ;3261          Z?                             ; BRANCH IF OK
U 111C, 0001,203D,0180,09E8,0000,1151   ;3262   =0     ERROR2,RC[0D]_Q
                                        ;3263
                                        ;3264   ;+
                                        ;3265   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3266   ;-
                                        ;3267
U 111D, 0010,0038,01C0.0970,0000,131A   ;3268          Q_RC[0E]                       ; GET CURRENT DATA PATTERN
U 131A, 0000,003C,03A8,0800,0000,131B   ;3269          Q_Q.LEFT,SI/MUL-               ; GENERATE NEXT PATTERN
U 131B, 0001,203C,0180,09F0,0000,131C   ;3270          RC[0E]_Q                       ; SAVE
U 131C, 0810,0038,0180,0960,0000,131D   ;3271          D_RC[0C]                       ; GET THE LOOP COUNT
U 131D, 0019,8000,0580,09E0,0010,131E   ;3272          RC[0C]_D-K[.1],CLK.UBCC,BYTE   ; DECREMENT AND CHECK
U 131E, 0000,013C,0180,0800,0000,111E   ;3273          Z?
U 111E, 0000,003C,0180,0800,0000,111B   ;3274   =0     J/T16FL1                       ; CONTINUE TESTING
                                        ;3275
                                        ;3276   ;////////////////////////////////////////////////////////////////////////
                                        ;3277   ;+
                                        ;3278   ; NOW FLOAT A ONE THRU BTEMP REGISTER 24
                                        ;3279   ;-
                                        ;3280
U 111F, 0018,0038,7580,09E0,0000,1120   ;3281   T16FS2: RC[0C]_K[.20]                 ; SET THE LOOP COUNT
U 1120, 0000,003D,0180,0800,0000,1169   ;3282   =0     SUBTEST
U 1121, 0018,0038,0580,09F0,0000,1122   ;3283          RC[0E]_K[.1]                   ; INITIALIZE THE DATA PATTERN
U 1122, 0000,003D,0180,0800,0000,114E   ;3284   =0     ERLOOP
U 1123, 0810,0038,0180,0970,0000,131F   ;3285   T16FL2: D_RC[0E]                      ; GET THE DATA PATTERN
U 131F, 0000,003C,0180,3400,0000,1320   ;3286   SYNC08: ID(SC)_D                      ; LOAD THE REGISTER
U 1320, 0000,003C,01F0,2400,0000,1321   ;3287   SYNC09: Q_ID(SC)                      ; READ THE REGISTER
U 1321, 001D,2000,0180,0800,0010,1322   ;3288          A[U_Q-D,CLK.UBCC               ; CHECK THE DATA
U 1322, 0000,013C,0180,0800,0000,1124   ;3289          Z?                             ; BRANCH IF OK
U 1124, 0001,203D,0180,09E8,0000,1151   ;3290   -0     ERROR2,RC[0D]_Q                ; BTEMP DATA PATH FAILED
                                        ;3291
                                        ;3292   ;+
                                        ;3293   ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3294   ;-
                                        ;3295
U 1125, 0010,0038,01C0,0970,0000,1323   ;3296          Q_RC[0E]                       ; GET THE DATA PATTERN
U 1323, 0021,203C,0180,09F0,0000,1324   ;3297          RC[0E]_Q.LEFT                  ; GENERATE NEXT PATTERN
U 1324, 0810,0038,0180,0960,0000,1325   ;3298          D_RC[0C]                       ; GET THE LOOP COUNT
U 1325, 0019,8000,0580,09E0,0010,1326   ;3299          RC[0C]_D-K[.1],CLK.UBCC,BYTE   ; DECREMENT AND CHECK
U 1326, 0000,013C,0180,0800,0000,1126   ;3300          Z?
U 1126, 0000,003C,0180,0800,0000,1123   ;3301   =0     J/T16FL2                       ; CONTINUE
                                        ;3302
                                        ;3303   ;////////////////////////////////////////////////////////////////////////
                                        ;3304   ;+
                                        ;3305   ; NOW WRITE A DATA PATTERN IN ALL 12 BTEMP REGISTERS AND READ IT BACK
                                        ;3306   ; AND CHECK IT. THIS IS A DUAL ADDRESSING TEST.
                                        ;3307   ;-
                                        ;3308
U 1127, 0818,0038,6580,0800,0000,1327   ;3309   T16FS3: D_K[.10]                      ; GENERATE THE DATA PATTERN
```

```
U 1327, 0819,0014,0580,0A80,0000,1328   ;3310             R[0]_D+K[.1],D_ALU              ; TO INCREMENT THE DATA
U 1328, 0000,003C,0180,0A00,0000,1329   ;3311             LAB_R[0]                        ; PATTERN THAT GETS WRITTEN
U 1329, 0000,003C,01F8,0800,0084,732A   ;3312             SC_R[.8],Q_0                    ; INTO EACH OF THE BTEMP
U 132A, 0D00,003C,0180,0800,0000,132B   ;3313             D_DAL.SC                        ; REGISTERS
U 132B, 081C,2014,0180,0800,0000,132C   ;3314             D_LA+D                          ; ...
U 132C, 0D00,003C,0180,0800,0000,132D   ;3315             D_DAL.SC                        ; ...
U 132D, 081C,2014,0180,0800,0000,132E   ;3316             D_LA+D                          ; ...
U 132E, 0D00,003C,0180,0800,0000,132F   ;3317             D_DAL.SC                        ; ...
U 132F, 001C,2014,0180,0A80,0000,1128   ;3318             R[0]_LA+D                       ; EQUALS 11111111
U 1128, 0000,003D,0180,0800,0000,1169   ;3319     =0      SUBTEST
                                        ;3320
U 1129, 0000,003C,0180,0800,0000,112A   ;3321             NOP
U 112A, 0000,003D,0180,0800,0000,114E   ;3322     =0      ERLOOP
U 112B, 0F00,003C,7980,0800,0084,7330   ;3323             SC_K[.30],D_0                   ; SET ADDRESS OF FIRST BTEMP AND
                                        ;3324                                             ; INITIAL DATA PATTERN
                                        ;3325     SYNC0A:
U 1330, 0000,003C,0180,3600,0000,1331   ;3326     T16FL3: ID(SC)_D,LAB_R[0]               ; LOAD THE REGISTER
U 1331, 081C,2014,0180,0800,0000,1332   ;3327             D_LA+D                          ; INCREMENT PATTERN TO WRITE
U 1332, 0018,0038,55C0,0800,0000,1333   ;3328             Q_K[.3F]
U 1333, 0019,A000,1D80,0800,0010,1334   ;3329             A[U_Q-SC,CLK.UBCC,BYTE          ; FINISHED LOADING YET?
U 1334, 0000,013C,0180,0800,0080,D12C   ;3330             Z?,SC_SC+1                      ; BRANCH IF YES
U 112C, 0000,003C,0180,0800,0000,1330   ;3331     =0      J/T16FL3                        ; CONTINUE LOADING
                                        ;3332
                                        ;3333     ;+
                                        ;3334     ; NOW READ EACH BTEMP
                                        ;3335     ;-
                                        ;3336
U 112D, 0000,003C,7980,0800,0084,7335   ;3337             SC_K[.30]                       ; SET THE START ADDRESS
U 1335, 0003,003C,0180,09F0,0000,1336   ;3338             RC[0E]_0                        ; INIT THE EXPECTED DATA
U 1336, 0018,0038,1D80,09E0,0000,1337   ;3339     T16FL4: RC[0C]_SC                       ; SAVE CURRENT BTEMP ADDRESS
U 1337, 0810,0038,0180,0970,0000,1338   ;3340             D_RC[0E]                        ; GET EXPECTED DATA
U 1338, 0000,003C,01F0,2400,0000,1339   ;3341     SYNC0B: Q_ID(SC)                        ; READ THE REGISTER
U 1339, 001D,2000,0180,0800,0010,133A   ;3342             A[U_Q-D,CLK.UBCC                ; CHECK THE DATA
U 133A, 0000,013C,0180,0800,0000,112E   ;3343             Z?                              ; BRANCH IF OK
U 112E, 0001,203D,0180,09E8,0000,1151   ;3344     =0      ERROR2,RC[0D]_Q                 ; DATA CHANGED IN ONE OF THE REGISTERS
                                        ;3345
                                        ;3346     ;+
                                        ;3347     ; THE FOLLOWING CODE IS LOOP CONTROL FOR THIS SUBTEST
                                        ;3348     ;-
                                        ;3349
U 112F, 0810,0038,0180,0970,0000,133B   ;3350             D_RC[0E]                        ; GET CURRENT EXPECTED DATA
U 133B, 0000,003C,0180,0A00,0000,133C   ;3351             LAB_R[0]                        ; LATCH INCREMENT CONSTANT
U 133C, 001C,2014,0180,09F0,0000,133D   ;3352             RC[0E]_LA+D                     ; SET NEXT EXPECTED DATA
U 133D, 0018,0038,55C0,0800,0000,133E   ;3353             Q_K[.3F]
U 133E, 0019,A000,1D80,0800,0010,133F   ;3354             A[U_Q-SC,CLK.UBCC,BYTE          ; DONE CHECKING YET?
U 133F, 0000,013C,0180,0800,0080,D130   ;3355             Z?,SC_SC+1                      ; BRANCH IF YES
U 1130, 0000,003C,0180,0800,0000,1336   ;3356     =0      J/T16FL4                        ; CONTINUE CHECKING
U 1131, 0000,003C,0180,0800,0000,1132   ;3357             NOP
                                        ;3358
                                        ;3359     =0
U 1132, 0000,003D,0180,0800,0000,113A   ;3360     T170:   NEWTST
U 1133, 0000,003C,0180,0800,0000,1340   ;3361             NOP
U 1340, 0000,003D,0180,0800,0000,113A   ;3362     ENDTST: NEWTST
```

```
;                           Location / Line Number Index

;Location        0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 0000 - 0FFF Unused
U 1000           1876:   1845    1847=   1866=   1867=   1868=   1884=   1885=
U 1008           2058=   2060=   2063=   2065=   2068=   2070=   2102=   2103=
U 1010           2104=   2105=   2106=   2108=   2144=   2145=   2146=   2147=
U 1018           2148=   2149=   2150=   2157=   2161=   2162=   2163=   2164=
U 1020           2170=   2171=   2179=   2186=   2187=   2188=   2190=   2191=
U 1028           2197=   2198=   2206=   2207=   2243=   2244=   2245=   2246=
U 1030           2256=   2257=   2258=   2259=   2267=   2268=   2276=   2284=
U 1038           2285=   2286=   2292=   2293=   2301=   2302=   2309=   2310=
U 1040           2319=   2320=   2326=   2327=   2335=   2336=   2343=   2351=
U 1048           2352=   2353=   2359=   2360=   2368=   2369=   1920:   2646=
U 1050           2378=   2379=   2422=   2423=   2425=   2426=   2438=   2439=
U 1058           2449=   2450=   1924:   1846    2461=   2462=   1928:   2647=
U 1060           2471=   2479=   2480=   2481=   2491=   2492=   2503=   2504=
U 1068           2513=   2521=   2522=   2523=   2533=   2534=   2545=   2546=
U 1070           2555=   2556=   2615=   2616=   2617=   2618=   2619=   2620=
U 1078           2621=   2622=   2624=   2625=   2629=   2630=   2634=   2635=
U 1080           2648=   2650=   2652=   1869    2654=   2655=   2660=   2661=
U 1088           2665=   2666=   2673=   2674=   2685=   2686=   2727=   2728=
U 1090           2649=   2651=   2653=   1870    2733=   2741=   2742=   2743=
U 1098           2747=   2748=   2749=   2750=   2758=   2764=   2765=   2766=
U 10A0           2767=   2768=   2772=   2778=   2787=   2788=   2789=   2796=
U 10A8           2798=   2799=   2809=   2810=   2815=   2821=   2823=   2824=
U 10B0           2828=   2834=   2835=   2836=   2845=   2853=   2854=   2855=
U 10B8           2867=   2869=   2901=   2902=   2907=   2914=   2915=   2916=
U 10C0           2917=   2918=   2920=   2921=   2925=   2926=   2932=   2938=
U 10C8           2939=   2940=   2941=   2942=   2953=   2961=   2962=   2963=
U 10D0           2964=   2965=   2967=   2968=   2970=   2971=   2973=   2974=
U 10D8           2980=   2988=   2989=   2990=   2991=   2992=   2997=   2998=
U 10E0           3001=   3002=   3008=   3016=   3017=   3018=   3019=   3020=
U 10E8           3031=   3033=   3034=   3035=   3083=   3084=   3092=   3093=
U 10F0           3097=   3098=   3103=   3109=   3115=   3122=   3123=   3124=
U 10F8           3125=   3126=   3131=   3137=   3142=   3150=   3160=   3161=
U 1100           1831:   1832:   1833:   1834:   1835:   1836:   1837:   1838:
U 1108           1839:   1871    3164=   3165=   1840:   1841:   1842:   1843:
U 1110           3173=   3179=   3186=   3192=   3198=   3199=   3242=   3243=
U 1118           3251=   3252=   3256=   3257=   3262=   3268=   3274=   3281=
U 1120           3282=   3283=   3284=   3285=   3290=   3296=   3301=   3309=
U 1128           3319=   3321=   3322=   3323=   3331=   3337=   3344=   3350=
U 1130           3356=   3357=   3360=   3361=   1872    1873    1874    1875
U 1138           1882    1883    1897    1898    1899    1900    1901    1902
U 1140           1903    1904    1905    1906    1907    1908    1909    1910
U 1148           1911    1912    1913    1914    1915    1916    1917    1918
U 1150           1919    1922    1923    1966    1967    2012:   1968    1969
U 1158           1970    1971    1972    1973    1974    1975    1976    1977
U 1160           1978    1979    1980    1981    1983    1984    1985    1986
U 1168           1988    1998    1999    2007    2008    2009    2032    2033
U 1170           2034    2035    2036    2038    2039    2040    2041    2043
U 1178           2044    2045    2046    2047    2053    2054    2055    2056
U 1180           2057    2061    2062    2066    2067    2071    2072    2083
U 1188           2084    2085    2086    2087    2088    2089    2158    2159
U 1190           2160    2165    2166    2167    2168    2169    2172    2173
U 1198           2174    2175    2176    2177    2178    2189    2192    2193
```

```
;Location       0/8     1/9     2/A     3/B     4/C     5/D     6/E     7/F

U 11A0          2194    2195    2196    2199    2200    2201    2202    2203
U 11A8          2204    2205    2247    2248    2260    2261    2262    2263
U 11B0          2264    2265    2266    2269    2270    2271    2272    2273
U 11B8          2274    2275    2287    2288    2289    2290    2291    2294
U 11C0          2295    2296    2297    2298    2299    2300    2303    2304
U 11C8          2305    2306    2307    2308    2318    2321    2322    2323
U 11D0          2324    2325    2328    2329    2330    2331    2332    2333
U 11D8          2334    2337    2338    2339    2340    2341    2342    2354
U 11E0          2355    2356    2357    2358    2361    2362    2363    2364
U 11E8          2365    2366    2367    2370    2371    2372    2373    2374
U 11F0          2375    2376    2377    2424    2427    2428    2429    2430
U 11F8          2437    2440    2441    2442    2443    2444    2445    2446
U 1200          2447    2448    2451    2452    2453    2454    2455    2456
U 1208          2457    2458    2459    2460    2463    2464    2465    2466
U 1210          2467    2468    2469    2470    2482    2483    2484    2485
U 1218          2486    2487    2488    2489    2490    2493    2494    2495
U 1220          2496    2497    2498    2499    2500    2501    2502    2505
U 1228          2506    2507    2508    2509    2510    2511    2512    2524
U 1230          2525    2526    2527    2528    2529    2530    2531    2532
U 1238          2535    2536    2537    2538    2539    2540    2541    2542
U 1240          2543    2544    2547    2548    2549    2550    2551    2552
U 1248          2553    2554    2623    2626    2627    2628    2631    2632
U 1250          2633    2636    2637    2644    2645    2656    2657    2658
U 1258          2659    2662    2663    2664    2667    2668    2669    2670
U 1260          2671    2672    2675    2676    2677    2678    2679    2680
U 1268          2681    2682    2683    2684    2729    2730    2731    2732
U 1270          2744    2745    2746    2751    2752    2753    2754    2755
U 1278          2756    2757    2769    2770    2771    2779    2780    2781
U 1280          2782    2783    2784    2785    2786    2797    2800    2801
U 1288          2802    2803    2804    2805    2806    2807    2808    2811
U 1290          2812    2813    2814    2822    2825    2826    2827    2837
U 1298          2838    2839    2840    2841    2842    2843    2844    2856
U 12A0          2857    2858    2859    2860    2861    2862    2863    2864
U 12A8          2865    2866    2015:   2870    2903    2904    2905    2906
U 12B0          2919    2922    2923    2924    2927    2928    2929    2930
U 12B8          2931    2943    2944    2945    2946    2948    2949    2950
U 12C0          2951    2952    2966    2969    2972    2975    2976    2977
U 12C8          2978    2979    2993    2994    2995    2996    2999    3003
U 12D0          3004    3005    3006    3007    3021    3022    3023    3024
U 12D8          3026    3027    3028    3029    3030    3036    3037    3038
U 12E0          3039    3091    3094    3095    3096    3099    3100    3101
U 12E8          3102    3110    3111    3112    3113    3114    3127    3128
U 12F0          3129    3130    3138    3139    3140    3141    3151    3152
U 12F8          3153    3154    3155    3156    3157    3158    3159    3162
U 1300          2013:   2014:   3168    3169    3170    3171    3172    3180
U 1308          3181    3182    3183    3184    3185    3193    3194    3195
U 1310          3196    3197    3250    3253    3254    3255    3258    3259
U 1318          3260    3261    3269    3270    3271    3272    3273    3286
U 1320          3287    3288    3289    3297    3298    3299    3300    3310
U 1328          3311    3312    3313    3314    3315    3316    3317    3318
U 1330          3326    3327    3328    3329    3330    3338    3339    3340
U 1338          3341    3342    3343    3351    3352    3353    3354    3355
U 1340          3362
```

```
;Location        0/8      1/9      2/A      3/B      4/C      5/D      6/E      7/F

U 1348 - 13EF Unused
U 13F0           1934:    1935:    1936:    1937:    1938:    1939:    1940:    1941:
U 13F8           1942:    1943:    1944:    1945:    1946:    1947:    1948:    1949:
```

```
           Words not
           in bounds
 ESK00DEF          0
 ESK00MAC          0
 ESKAHMAC          0
  ESKAH3C        849

Used             849
Remaining

Total microwords used in memory U: 849
Total microwords remaining in memory U: 0
Highest address used in memory U: 13FF (hex)
```

```
; The files used in this assembly are:
ESK00DEF.MIC
ESK00MAC.MIC
ESKAHMAC.MIC
ESKAH3C.MIC


Pass 1 warnings:    0   Pass 2 warnings:    0
Pass 1 errors:      0   Pass 2 errors:      0
```